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THESIS

**STREAMLINING OF
ARMY
ACQUISITION CATEGORY (ACAT) IV
PROGRAMS**

by

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March, 1995

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13. ABSTRACT *(maximum 200 words)*

The 1986 Packard Commission review of Defense management recommended a consolidation of the Services' materiel acquisition regulations under an umbrella regulation, DoD 5000. Adopted in 1991, this regulation created four levels of management oversight, Acquisition Categories (ACAT) I - IV, and it encouraged streamlining of the process for the smaller ACAT III and IV programs.

This study examines the streamlining of DoD 5000 procedures across the smallest U.S. Army programs (ACAT IV). It investigates differences among Commands and streamlining techniques that are most prevalent and useful. The basis of the study consisted of literature searches, interviews, and a questionnaire, with questions that required numeric and essay responses, that was distributed Army-wide to all ACAT IV managers, and synthesis of this collection of information. A total of 19 managers responded.

The study concluded that there are no significant differences among the U.S. Army Commands concerning the application of acquisition streamlining techniques. In addition, it identified which techniques were most prevalent, which saved the most program time and funding, and the reasons for differences among Commands and between small and large programs. The study recommends that the Army establish an ACAT IV baseline development management process that incorporates the most prevalent and useful streamlining techniques.

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STREAMLINING OF ARMY ACQUISITION CATEGORY (ACAT) IV PROGRAMS

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ABSTRACT

The 1986 President's Blue Ribbon Commission on Defense Management (Packard Commission) recommended a consolidation of the Services' materiel acquisition regulations under an umbrella regulation, DoD 5000. Adopted in 1991, this regulation created four levels of management oversight, Acquisition Categories (ACAT) I - IV, and it encouraged streamlining or tailoring of the process for the smaller ACAT III and IV programs.

This study examines the streamlining of the DoD 5000 procedures across the smallest U.S. Army programs (ACAT IV). It investigates differences among Commands and which streamlining techniques are most prevalent and useful. The basis of the study consisted of literature searches, personal and telephonic interviews, and a questionnaire, with questions that required numeric and essay responses, that was distributed Army-wide to all ACAT IV managers, and synthesis of this collection of information. A total of 19 managers responded.

The study concluded that there are no significant differences among the U.S. Army Commands concerning the application of acquisition streamlining techniques. In addition, it identified which techniques were most prevalent, which saved the most program time and funding, and the reasons for differences among Commands and between small and large programs. The study recommends that the Army establish an ACAT IV baseline development management process that incorporates the most prevalent and useful streamlining techniques.

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EXECUTIVE SUMMARY

In the late 1980's, the President's Blue Ribbon Commission on Defense Management (Packard Commission) in A Quest for Excellence, Final Report to the President recommended, and the Department of Defense (DoD) Defense Management Review instituted, a consolidation of the Services' materiel acquisition regulations under an umbrella regulation, DoD 5000. This regulation was adopted in 1991 and it changed many aspects of how the Services manage and conduct material development programs. The system adopted by DoD created four levels of management oversight, Acquisition Categories (ACAT) I - IV.

The new DoD 5000 series concentrates on the management oversight required for large ACAT I programs. The regulations outline the processes required of ACAT I managers, and encourages tailoring, or streamlining of the process by ACAT II, III, and IV managers, while not allowing for across-the-board Service-level policies.

The purpose of this research was to analyze the streamlining of DoD 5000 procedures and processes across all of the smallest U.S. Army programs (ACAT IV); to investigate differences among various U.S. Army Commands and determine which streamlining techniques were most prevalent, useful, and the circumstances that cause them to be successful. Individual managers need to streamline to effectively manage program risk, but they lack key data necessary for conducting proper risk assessments. This study sought to provide this missing risk assessment data. Specific purposes were to determine whether Commands need assistance in gaining knowledge concerning all of the streamlining techniques available (being used by others) and to provide the ACAT IV managers with tools to assist them in their streamlining decision-making.

Primary Research Question: What acquisition streamlining techniques are utilized by U.S. Army ACAT IV managers?

Subsidiary Research Questions:

(1) How do U.S. Army Commands streamline ACAT IV programs differently? - Comparing the techniques utilized Command-by-Command .

(2) How do the various streamlining techniques compare with respect to program cost savings? - Comparing technique-to-technique.

(3) How do the various streamlining techniques compare with respect to program schedule reduction? - Comparing technique-to-technique.

The methodology utilized for this effort was a management problem analysis using both quantitative and qualitative techniques. The qualitative techniques involved the use of interviews to determine the opinions of the AMC acquisition policy Subject Matter Experts concerning the validity and breadth of the techniques to be investigated. The information from this process was assimilated into a broad-based questionnaire that was distributed Army-wide to all ACAT IV development managers, with questions that required numeric and essay responses. The numeric responses were quantitatively analyzed, and the essay responses were used to find elaboration/causal relationships for specific responses and/or trends observed in the data.

In support of this thesis, 39 questionnaires were distributed to the ACAT IV development managers at various U.S. Army AMC Commands. Two Commands, CECOM and MICOM, were eliminated from the survey as is was determined that all of their development programs were at the ACAT III level or higher. A total of 19 responses were obtained, with some Commands providing limited responses. The data that was received was deemed to be valid, and the analysis was conducted on a predominately qualitative basis.

From the study, it was concluded that cross-fertilization of streamlining concepts exists among the U.S. Army Commands. The information is available for all Commands to use. In addition, relative usage levels for the various techniques is consistent among Natick and the other U.S. Army Commands. For those techniques where the usage

differed the most, the reasons were disagreement with the value or risk of the technique, or specific commodity/Command differences.

A number of streamlining techniques are used routinely by ACAT IV programs. The risk levels associated with the combining of Milestones and test phases are considered acceptable for programs at this lower level of complexity. Although quantifiable and useful ranges for the levels of anticipated savings for the techniques could not be projected from the research, the following can be concluded as the key techniques utilized by most ACAT IV managers.

1. Combining of Milestones 0 and I, and/or I and II.
2. Combining of test phases, both in Dem/Val and EMD, for Natick managers.
3. Concurrency of test phases, both in Dem/Val and EMD, for non-Natick managers.
4. Combining development deficiency correction validation testing with First Article Testing.

Small and large ACAT IV program managers are in close agreement concerning the relative cost savings associated with each of the streamlining techniques in the study. The two areas where large programs deviated from the trend are: (1) combining EMD DT and IOT&E, and (2) using a single contract for Dem/Val and EMD, both of which may be due to the increased complexity of larger programs.

It is recommended that the results of this study be broadly distributed to ACAT IV managers. Even though the results provide no quantitative assistance for ACAT IV managers concerning expected savings levels for the various streamlining techniques investigated, the study does provide valuable information that should assist managers in their streamlining decision-making.

It is further recommended that the U.S. Army revise the baseline development process for ACAT IV programs, to one that incorporates the above key streamlining techniques as standard procedures from which requirements are either increased, or decreased. In place of the current system, where the manager must begin with the full

ACAT I/II process and struggle with the acquisition team members to cut out elements, this recommendation would put acquisition team members in a position of justifying the need for adding requirements versus the manager having to justifying their exclusion.

I. INTRODUCTION

In the late 1980's, a Department of Defense (DoD) review of acquisition management practices resulted in the consolidation of the Services' materiel acquisition regulations under an umbrella regulation, DoD 5000. This regulation was adopted in 1991 and it changed many aspects of how the Services manage and conduct material development programs. The system adopted by DoD created four levels of management oversight, Acquisition Categories (ACAT) I - IV. Application of these categories is based on program size and/or the special interests of the Office of the Secretary of Defense and the Service' headquarters. The largest and most significant programs are ACAT I and, conversely, the smallest and least significant are ACAT IV.[Ref. 1]

One aspect of the new DoD 5000 series that did not exist in the old regulations is that the Services are now prohibited from regulatory supplementation. This was instituted to specifically eliminate the possibility of the Services reverting to Service-specific policy. Unfortunately, it also creates an inability for a Service to implement an across-the-board policy for streamlining the procedures and processes outlined in DoD 5000 without OSD approval. DoD 5000 does, however, encourage streamlining or tailoring the process on a project-by-project basis.[Ref. 2]

A. PROBLEM DEFINITION

The purpose of this research is to analyze the streamlining of DoD 5000 procedures and processes across all U.S. Army ACAT IV programs as well as to investigate differences among Commands and determine which streamlining techniques are most prevalent, useful, and the circumstances that cause them to be successful. From the researcher's twelve years of experience in ACAT IV development management and discussions with colleagues within the U.S. Army, streamlining of ACAT IV programs has been taking place, but on an ad-hoc, trial-and-error basis. Comparison, or cross-fertilization, of information among individual managers and Commands (concerning which streamlining techniques have, or have not worked) has only taken place through

informal channels. It can be expected that **within** each Command, the information has been disseminated fairly well, since each Command has a support organization on acquisition policy that is involved in each project's planning.[Ref. 3] However, the ability to pass ideas **between** Commands may be incomplete, since there is not a formal means to channel this information. Therefore, this study investigates the various streamlining techniques utilized by ACAT IV managers among the various Commands and seek to define the causal relationships for their use. Specific purposes are to determine whether Commands need assistance in gaining knowledge concerning the streamlining techniques available and to provide the ACAT IV managers with tools to assist them in their streamlining decision-making. This study draws conclusions regarding which techniques are most useful, which need to be advertised to other Commands, and the key factors that influence the streamlining decision-making process.

1. Research Questions

Primary Research Question: What acquisition streamlining techniques are utilized by U.S. Army ACAT IV managers?

Subsidiary Research Questions:

(1) How do U.S. Army Commands streamline ACAT IV programs differently? (Comparing the techniques utilized Command-by-Command).

(2) How do the various streamlining techniques compare with respect to program cost savings? (Comparing technique-to-technique).

(3) How do the various streamlining techniques compare with respect to program schedule reduction? (Comparing technique-to-technique).

2. Expected Benefit

This research is intended to determine if tools exist that ACAT IV managers can use to improve their acquisition streamlining decisions, and, if so, provide these managers with alternative streamlining techniques not previously considered by their Commands. The results are also intended to assist policy makers and support commands when they consider the adoption of streamlining policies for ACAT IV programs, or their application to new program starts.

This research effort investigates one aspect of the management of small programs, the streamlining techniques that the experts, the current ACAT IV managers, have deemed beneficial to their programs. This research is unique in that it focuses on the smallest acquisition programs. As noted by the lack of related research discovered in the literature search for this research project (see the literature search results below), efforts at acquisition reform and streamlining have been almost exclusively concentrated on the high-visibility, high-cost weapon system acquisitions (the ACAT I and IIs). Thus, the smaller programs have not been considered in depth, and they have been required to use the DoD 5000 policies and procedures tailored for the larger programs. This effort is sponsored by the U.S. Army Natick Research, Development, and Engineering Center, the organization containing the majority of the U.S. Army's ACAT IV development programs.

3. Boundaries

This study investigates acquisition streamlining techniques within the context of tailoring acquisition procedures and documentation, per DoD 5000 direction, for the development of new U.S. Army ACAT IV systems. The research includes analysis of all available on-going and recently completed U.S. Army ACAT IV development programs, except as noted in the limitations and constraints below. This is not an evaluation of the use of commercial versus military specifications and standards, and it excludes non-developmental and classified ACAT IV programs, as well as non-regulatory program acceleration techniques such as improved business management processes, Total Quality Management, program management software tools, etc.

4. Limitations and Constraints

Programs that are in production are excluded, because of the difficulty in accessing past managers (who have been reassigned) and the time and funding constraints of this research effort. However, this should not be a significant limitation since the ACAT system has only existed for three years, and these programs largely would have been developed under the old system. Also, the amount of funding and time available did

not allow for travel to conduct face-to-face interviews with each of the ACAT IV managers.

As will be discussed later in this paper, the main support instrument for this research, a written questionnaire, had a low response rate. Investigation of the lack of response found that: there are not as many ACAT IV development managers as anticipated, some managers are not as knowledgeable as assumed, and some managers did not have time available to complete the questionnaire. Because of this limitation, the analysis is predominately qualitative, instead of quantitative, in nature.

5. Assumptions

It is assumed, from the researcher's experience at the U.S. Army Natick Research, Development, and Engineering Center, that streamlining is a concern of all U.S. Army ACAT IV managers. It is also assumed that the ACAT IV managers are the most knowledgeable as to which streamlining techniques are most effective, because it is their mission to manage these decisions, and they should have an established knowledge base from their experiences and discussions with technical support staffs.

Additional assumptions are as follows: generalized relationships exist among ACAT IV programs (with respect to streamlining initiatives) that can be analyzed within the constraints of this study; as all ACAT IV programs follow the same general process (and are relatively low risk) qualitative comparisons of ACAT IV processes and streamlining techniques should be possible; managers aren't able to exactly quantify the impacts of individual streamlining initiatives; and a sufficient quantity of ACAT IV managers exist, and a sufficient number of the managers are willing to participate, to provide a meaningful basis for analysis.

B. METHODOLOGY

The approach utilized for this effort was a management problem analysis through a survey of all U.S. Army ACAT IV project managers/officers for their expert opinions concerning streamlining techniques. They were asked if they have, or would utilize specific streamlining initiatives, and rate/comment on the cost and schedule savings

associated with each. Also, comments were requested concerning the key factors that led to the above ratings. Results were then evaluated comparatively, both by Command and by technique.

Because the population of ACAT IV managers is geographically dispersed, the data collection methods used were telephone interviews and written questionnaires. The broad, investigative nature of the questions being addressed in this initial study of ACAT IV management made this methodology acceptable. In addition, the effects of this constraint were mitigated through careful construction of the questionnaire materials. For instance, the telephone interviews established a mutually exclusive and exhaustive set of streamlining techniques for use in the written questionnaires (allowing for closed-ended questions), and the size of the respondents programs were established (in terms of cost and duration) to ensure that the comparative analysis encompassed programs of similar size.

C. LITERATURE REVIEW

A review of the available literature revealed no directly related past efforts. This result is understandable, given the general focus within the DoD on the major systems, and the newness of the ACAT designation system.

A number of previous studies did consider acquisition streamlining, but at a much broader level. One of these reviews was the President's Blue Ribbon Commission of 1986, discussed in Chapter II, which was the impetus for the new DoD 5000 series. These studies were, however, non-analytical, expert panel reviews of the overall process. None analyzed streamlining across projects, and none considered non-major, or ACAT IV programs.

One previous study was closely related to the purpose and methodology of this research effort. A 1991 study by Mr. Henry Jehan, for the U.S. Army War College, examined the impact of the Packard Commission on the U.S. Army ACAT I, II, and III managers (the population of U.S. Army development managers specifically **not** within the scope of the current research effort). Mr. Jehan utilized a questionnaire to all

available members of the population (the Program and Product Managers), which corresponded closely to the methodology planned for this effort. Mr. Jehan's research questions did not, however, investigate the same issues as the current research. His research question was stated as follows:

> The central question this study attempts to answer is: how well has the Army implementation embodied the recommendations of the Packard Commission? Specifically, do the current Army management structures conform to the structures recommended by the Commission? And more importantly, does the Army acquisition process implement the spirit of the Commission's recommendations?[Ref. 4]

Mr. Jehan's report provides a useful general outline for conducting the current study. It confirms the validity of the methodology and it contains data sources and questionnaire lessons learned that can be applied to this research.

The two previous acquisition streamlining theses at the Naval Postgraduate School were completed prior to the advent of the ACAT system. Those studies focused on the investigation of streamlining within a specific program/Command and they consisted mainly of historical assessments of that organization's streamlining actions. The first, written by Mary Walsh and published in December 1986, utilized reviews of regulations and program documents, as well as interviews and resulted in a case study. The purpose was to analyze the effectiveness of the then new Army Streamlined Acquisition Program (ASAP), the Navy T-45 Trainer development program, and the Army and Navy implementation of the since superseded DoDI 5000.43, "Acquisition Streamlining".[Ref. 5] The second, written by Michelle McKeever and published in June 1987, reviewed the acquisition streamlining activities within the Space and Naval Warfare Systems Command. It also followed a case study methodology using interviews and document reviews.[Ref. 6]

From this literature review, and the researcher's experience with past U.S. Army management studies of the acquisition process that all concentrated on major weapon systems, it is felt that this research is in a new area of investigation.

D. SUMMARY OF FINDINGS

1. Conclusions

From this study, it can be concluded that cross-fertilization of streamlining concepts exists among the U.S. Army Commands. The information is available for all Commands to use. In addition, relative usage levels for the various techniques is consistent among Natick and the other U.S. Army Commands. For those techniques where the usage differed the most, the reasons were disagreement with the value or risk of the technique, or specific commodity/Command differences.

A number of streamlining techniques are used routinely by ACAT IV programs. The risk levels associated with the combining of Milestones and test phases are considered acceptable for programs at this lower level of complexity. Although quantifiable and useful ranges for the levels of anticipated savings for the techniques could not be projected from the research, the following can be concluded as the key techniques utilized by most ACAT IV managers.

1. Combining of Milestones 0 and I, and/or I and II.
2. Combining of test phases, both in Dem/Val and EMD, for Natick managers.
3. Concurrency of test phases, both in Dem/Val and EMD, for non-Natick managers.
4. Combining development deficiency correction validation testing with First Article Testing.

In addition, ACAT IV programs generally do not require COEA or STAR program documents, and the acceleration of independent evaluation and assessment reporting for Milestone Decision Reviews is commonly done to accelerate the process during the time-sensitive weeks prior to a major decision review.

Small and large ACAT IV program managers are in close agreement concerning the relative cost savings associated with each of the streamlining techniques in the study. The two areas where large programs deviated from the trend are: (1) combining EMD DT and IOT&E, and (2) using a single contract for Dem/Val and EMD, both of which may be due to the increased complexity of larger programs.

2. Recommendations Regarding ACAT IV Management

It is recommended that the results of this study be broadly distributed to ACAT IV managers. Even though the results provide no quantitative assistance for ACAT IV managers concerning expected savings levels for the various streamlining techniques investigated, the study does provide valuable information that should assist managers in their streamlining decision-making.

It is further recommended that the U.S. Army revise the baseline development process for ACAT IV programs, to one that incorporates the above key streamlining techniques of combining of Milestones I and II concurrent test phases in EMD as standard procedures from which requirements are either increased, or decreased. In addition, it is recommended that the alternative process exclude the requirements for COEA and STAR, except on an exception basis only. In place of the current system, where the manager must begin with the full ACAT I/II process and struggle with the acquisition team members to cut out elements, this recommendation would put acquisition team members in a position of justifying the need for adding requirements versus the manager having to justifying their exclusion.

3. Recommendations for Further Research

Considering the lack of statistically significant results from this study, it is recommended that further study be conducted that concentrates on the most significant techniques, investigating more in-depth the establishment of useful statistics, such as confidence intervals, for the expected levels of cost and schedule savings.

Based on the small number of ACAT IV managers in the U.S. Army it is recommended that future research in this area consider both ACAT III and ACAT IV managers to study the differences between the two groups, and, if they prove to be similar, combine the two for statistical information concerning expected savings.

Since the Marine Corps has many more ACAT III and IV programs than ACAT I and II, and they are actively streamlining wherever possible, it is recommended that further research be conducted that considers both Army and Marine Corps programs.

II. BACKGROUND

A. THE DOD 5000 SERIES

During the early 1980s, major problems with DoD management of weapon systems acquisitions had become issues of concern within the Executive Branch and Congress. In addition, the press and the American public were raising concerns of perceived fraud, waste, and abuse. Cost overruns on weapon systems, outrageous spare parts prices, and alleged fraudulent activities within the Department and it's contractors brought an overwhelming desire for reforms.[Ref. 7] In response to these problems, by Executive Order 12526, President Reagan chartered a commission in July 1985 to conduct a study of Department of Defense management problems. The President's Blue Ribbon Commission on Defense Management, more popularly known as the "Packard Commission" after the chairman of the Commission, former Deputy Secretary of Defense Mr. David Packard, took a broad and in-depth look at defense weapon system acquisition issues and their root causes. Their charter said that:

> The Commission shall study the issues surrounding defense management and organization.... The primary objective of the Commission shall be to study defense management policies and procedures, including the budget process, the procurement system, legislative oversight, and the organizational and operational arrangements, both formal and informal, among the Office of the Secretary of Defense, the Organization of the Joint Chiefs of Staff, the unified and Specified Command system, the Military Departments, and the Congress. In particular, the Commission shall:
>
> 1. *Review the adequacy of the defense acquisition process, including* the adequacy of the defense industrial base, current law governing Federal and Department of defense procurement activities, *departmental directives and management procedures, and the execution of acquisition responsibilities within the Military Departments.* (Emphasis added)[Ref. 8]

The goals of the Commission included strengthening and streamlining the control and supervision of the acquisition process. One of the many significant recommendations

proposed by the Commission in their June 1986 report was the consolidation and simplification of acquisition laws and regulations.[Ref. 9] A follow-on review of the regulations governing the Service's acquisition processes led to a July 1989 Defense Management Review (DMR) Decision to consolidate the material acquisition regulations of the Services under an umbrella set of regulations. The basis for this effort was to eliminate unnecessary Service-unique oversight and bureaucracy, and streamline the overall process.[Ref. 10]

The new DoD Directive 5000.1, "Defense Acquisition"; DoD Instruction 5000.2, "Defense Acquisition Management Policies and Procedures"; and DoD Manual 5000.2-M, "Defense Acquisition Management Documents and Reports", all dated 23 February 1991, replaced the 1987 versions of DoDD 5000.1 and DoDI 5000.2. Publication of these documents was the result of a two year project under three Under Secretaries of Defense for Acquisition. More than 60 previous directives, instructions, manuals and memoranda were canceled by these new documents.

This new "5000 Series" provided a single uniform acquisition system for all of the Services' acquisition programs: major defense acquisition programs, non-major defense acquisition programs, and highly sensitive classified programs. The DODI 5000.2 states that the acquisition process shall be structured in discrete phases separated by major milestones. Under the old DoDI 5000.2, there were six major milestones (O through V), and five phases. The new DoDI 5000.2 provides for five major milestones with phases as shown in Figure 1.[Ref. 11]

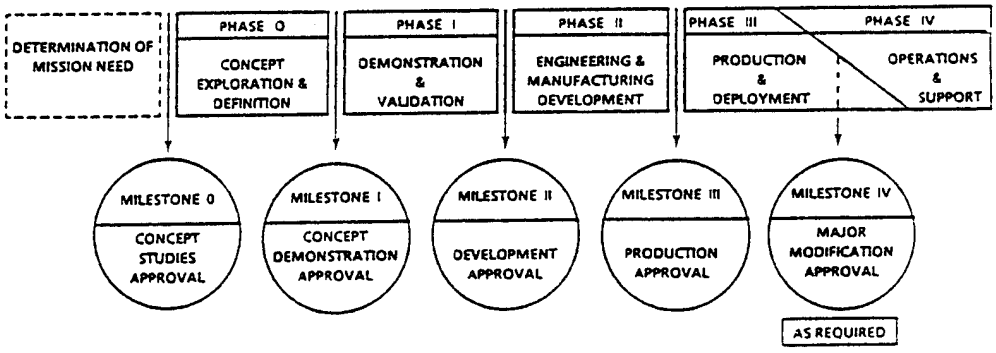

Figure 1. Acquisition Milestones and Phases.

B. THE ACQUISITION CATEGORY SYSTEM

Under the new DoD 5000 series, defense acquisition programs are divided into acquisition categories (ACATs) using the criteria shown in Figure 2. The ACAT designations indicate which programs come under the Defense Acquisition Board (DAB) or under a DoD Component Acquisition Executive for review and oversight. The DAB is the senior DoD acquisition review board and it is chaired by the Under Secretary of Defense for Acquisition. The Vice Chairman of the Joint Chiefs of Staff is the Vice-Chair. Other members of the Board are: the Deputy Under Secretary of Defense for Acquisition; Service Acquisition Executives of the Army, Navy, and Air Force; the Director of Defense Research and Engineering; the Assistant Secretary of Defense for Program Analysis and Evaluation; the Comptroller of the Department of Defense; the Director of Operational Test and Evaluation; the appropriate DAB Committee Chair; and the DAB Executive Secretary. The DoD Component Acquisition Executive is a single official within each DoD Component who is responsible for all acquisition functions within that Component. For the Army, this individual is the Assistant Secretary of the Army for Research, Development, and Acquisition.[Ref. 12]

The programs with the lowest cost and risk, those that were classified as non-major under the old system, are classified as ACAT III and IV under the new series. A major distinction between ACAT III and IV programs and ACAT I and II programs is that the DoD Component Acquisition Executives may delegate decision authority for ACAT III and IV programs to the lowest level deemed appropriate within their respective organizations.[Ref. 13] For Army ACAT IV systems, this Milestone Decision Authority (MDA) designation is generally established at the Major Subordinate Command (MSC) level within the Army Material Command (AMC). See Figure 3 for a schematic of the applicable U.S. Army Command structure.[Ref. 14]

Within U.S. Army practices, any program that does not meet the criteria for ACAT I or II, but has a Program or Product Manager assigned, receives an ACAT III designation. All other programs are designated as ACAT IV by default, and are managed

ACAT	SELECTION CRITERIA	DESIGNATION AUTHORITY	MILESTONE DECISION AUTHORITY
I	• A program not classified as highly sensitive by the Secretary of Defense that has: •• Been designated by the Under Secretary of Defense (Acquisition) as an acquisition category I program or is •• Estimated by the Under Secretary to require: - An eventual expenditure for research, development, test, and evaluation of more than $200 million in fiscal year 1980 constant dollars (approximately $300 million in fiscal year 1990 constant dollars); or - An eventual expenditure for procurement of more than $1 billion in fiscal year 1980 constant dollars (approximately $1.8 billion in fiscal year 1990 constant dollars)	• Under Secretary of Defense (Acquisition) • Acquisition category I programs are further designated by the Under Secretary of Defense (Acquisition) as either requiring decision by the: •• Under Secretary - ACAT I D •• Component Head - ACAT I C	• ACAT I D - Under Secretary of Defense (Acquisition) • ACAT I C - DoD Component Head or, if delegated, the DoD Component Acquisition Executive
II	• A program not meeting the criteria for category I that has: •• Been designated by the DoD Component Head as an acquisition category II program or is •• Estimated by the DoD Component Head to require: - An eventual expenditure for research, development, test, and evaluation of more than $75 million in fiscal year 1980 constant dollars (approximately $115 million in fiscal year 1990 constant dollars); or - An eventual expenditure for procurement of more than $300 million in fiscal year 1980 constant dollars (approximately $540 million in fiscal year 1990 constant dollars)	• DoD Component Head or, if delegated, the DoD Component Acquisition Executive	• DoD Component Head or, if delegated, the DoD Component Acquisition Executive
III	• Programs not meeting the criteria for category I and II that have been designated category III by the DoD Component Acquisition Executive	• DoD Component Acquisition Executive	• Lowest level deemed appropriate by the designation authority
IV	• All other acquisition programs for which the milestone decision authority should be delegated to a level below that required for category III	• DoD Component Acquisition Executive	• Lowest level deemed appropriate by the designation authority

Figure 2. The Acquisition Categories and Milestone Decision Authority, from Ref. 2

U.S. Army Organizational Structure
ACAT IV Programs

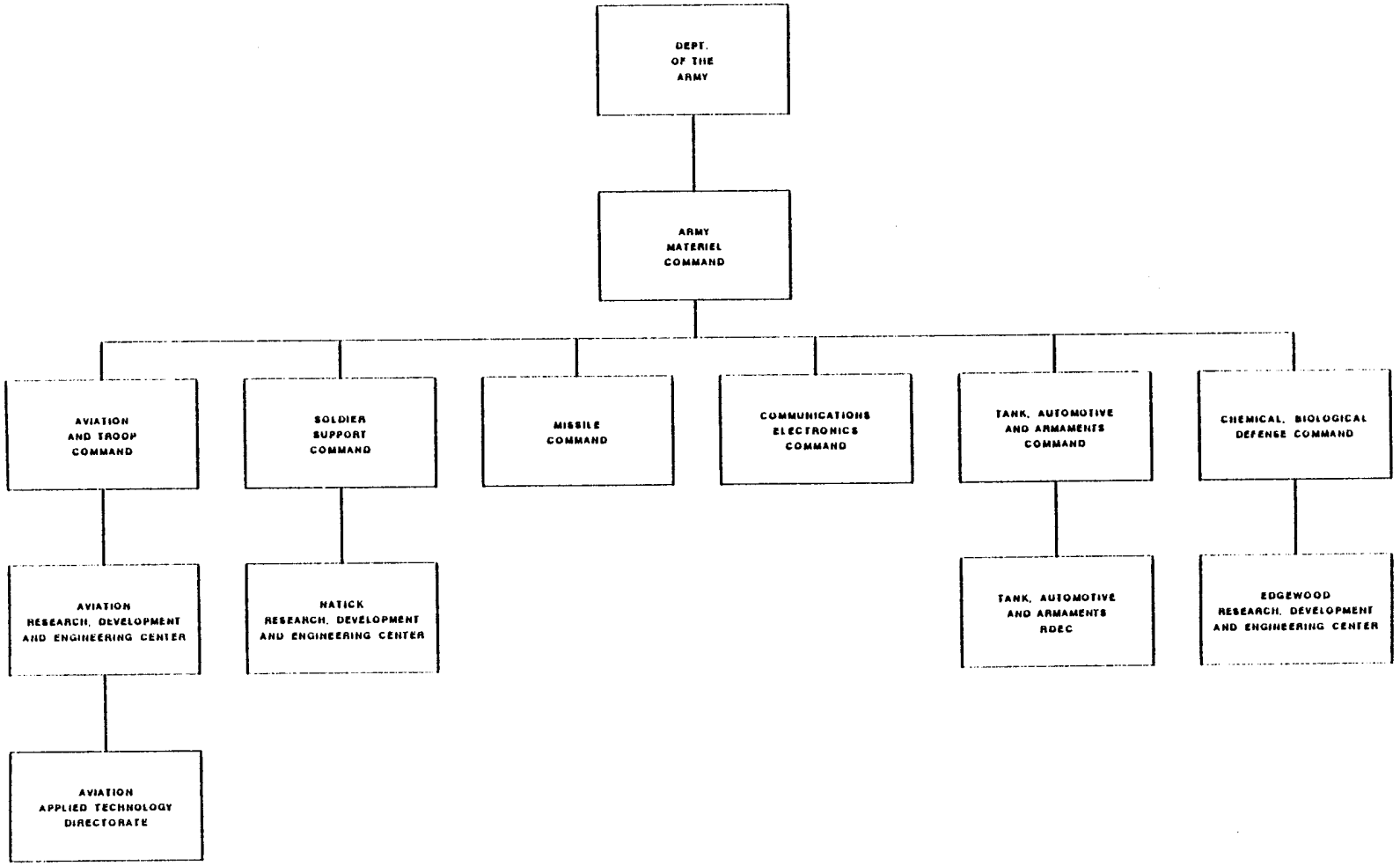

Figure 3. Army ACAT IV Management Organizational Structure

by individuals within the MSCs who do not receive a formal designation as Program or Product Manager. For programs in production, these ACAT IV managers are typically civilian Weapons System Managers at the MSC headquarters. For those programs still in development, the manager is typically a civilian technical expert with an informal title of Project Officer. He is usually located at a Research, Development, and Engineering Center (RDEC) that is subordinate to a related MSC.[Ref. 15]

A typical example of an ACAT IV program would be the Army's next generation of general purpose tentage, the Modular General Purpose Tent System. This effort seeks to apply modern materials and structures to replace the 1950s vintage tentage currently in use by all of the Services. The technological risk is very low, total development costs will be less than $2 million, and the requirement is not threat or vulnerability driven. This logistics/quality-of-life oriented effort certainly does not warrant the oversight required for a major ACAT I or II weapon system. The management structure supporting this effort includes the GS-12 civilian Project Officer and his management chain-of-command. The MDA is the MSC, Aviation and Troop Command (ATCOM), Executive Director for Integrated Materiel Management.[Ref. 16]

C. STREAMLINING THE PROCESS

One aspect of the new DoD 5000 series that did not exist in the old regulations is that the Services are now prohibited from regulatory supplementation. DoD 5000.2 states:

> Unless prescribed by statute or specifically authorized herein, the policies and procedures set out in this Instruction shall not be supplemented without the prior approval of the Under Secretary of Defense for Acquisition.... Implementation directives, instructions, regulations, and related issuances shall be kept to the essential minimum as deemed appropriate by the DoD Component Acquisition Executive. Copies of all such issuances shall be provided to the Director of Acquisition Policy and Program Integration, Office of the Under Secretary of Defense for Acquisition within 10 days of publication.[Ref. 17]

This effectively ensures that the Services do not circumvent the goal of the new regulation by instituting Service-specific implementation policy. Unfortunately, it also creates an inability for a Service to implement beneficial across-the-board policies without OSD approval. Streamlining the procedures and processes of DoD 5000 for all ACAT IV programs, for instance. DoD 5000 does, however, encourage streamlining or tailoring of the process on a project-by-project basis. DoD 5000.2 states:

> Tailoring of Acquisition Procedures and Documentation. The policies and procedures described in this Instruction shall apply directly to Acquisition Category I programs and will be tailored as defined in subsection B.5., above, for acquisition category II, III, and IV programs subject to the approval of the milestone decision authority.[Ref. 18]

Furthermore, DoD 5000.1 requires that acquisition strategies and program plans be streamlined to minimize acquisition time and life-cycle costs, consistent with the urgency of the need and degree of technical risk involved. Streamlining becomes particularly important for the smaller, ACAT IV programs since the procedures outlined in DoD 5000 are written for the management oversight needs of the largest ACAT I and II weapon systems.[Ref. 19]

As noted in the above excerpt from DoD 5000.2, DoD 5000 gives broad power to the MDA to decide, among other things, whether a program streamlining plan is acceptable. This power was most recently emphasized by the Under Secretary of Defense (Acquisition and Technology) in a 23 August 1994 memorandum to the Service Secretaries titled: "Tailoring Acquisition Procedures and Documentation for Acquisition Category II, III and IV Programs" which should allow for consideration of more innovative streamlining methods than could be agreed to by all members of the acquisition team in the past. The memorandum states:

> The specific form or number of program documents should be determined by the MDA. As long as tailoring is consistent with any applicable statutory requirements, the MDA has full authority to reduce or eliminate any procedures or documents that he or she deems unnecessary.[Ref. 20]

As defined in the Defense Systems Management College's Risk Management Concepts and Guidance Manual, streamlining is a part of the risk management decision making process, a necessary consideration if the manager is to optimize his project's cost, schedule and performance. While developing a program plan or acquisition strategy, as well as during the life of a program, the manager must consider risk-related trade-offs, some of which involve streamlining considerations. Risks to the manager are all rooted in the determination to deliver a specified product or level of performance at a specified time for a specified cost. The manager may fail in any of three ways, or combination thereof. The product may not be up to the performance level specified, the actual costs may be too high, or delivery may be too late. According to the Risk Management Manual, risk can be categorized into five facets to segment and manage the cost, schedule, and performance issues of a project. These risk facets are technical performance, supportability, programmatic (loss of funds, availability of test assets, etc.), cost, and schedule. If streamlining isn't considered, projects run the risk of being too slow to fielding, or overly costly to develop. Streamlining will increase risk, but the goal of any effective manager is to balance the project's risk with the cost, schedule, and performance attributes of the effort. Thus, streamlining is a large part of the manager's overall risk management strategy.[Ref. 21]

Illustrative examples of this risk management process as it relates to streamlining and the schedule, performance, and cost attributes of a program are: (1) Schedule: An urgent mission need for a capability, either because of an increase to combat effectiveness or due to system obsolescence, can lead to a need for streamlining of the process in order to shorten the time to fielding for the new capability. The manager evaluates this requirement, the schedule reduction options available, and the risk associated with each; (2) Performance: The decision-maker determines that a program's relatively low degree of technical risk, based on the maturity of the technology being employed and the complexity of the system, will allow for skipping of milestone events and streamlining of the program; or (3) Cost: The decision maker considers that streamlining the development program will reduce costs in both development and

operations and support (where the capability being replaced may have a higher maintenance cost due to it being beyond its useful life). He must evaluate cost concerns with an acceptable degree of risk.

All of these streamlining considerations are based on trade-offs of costs (e.g., lack of availability of development funds, potential O&S cost savings) and schedule (e.g., urgent need) with the risk of technical performance, supportability, or programmatic failure with each of these decisions. To properly assess these considerations, the decision maker requires a sound risk assessment methodology utilizing data concerning the impacts of each decision option and the key factors relating to each. Key factors (utilized for trade-offs among schedule, cost, and risk) would be attributes such as technological maturity, system complexity, urgency of need, availability of funding (both for development and production), and availability of personnel and facilities (for oversight, testing, etc.). This study seeks to establish this assessment data and key factors for use by ACAT IV managers in conducting risk assessments on their programs.[Ref. 22]

The researcher's experience and information from the MSC POCs identified the streamlining techniques employed for ACAT IV projects that were investigated in this research effort. Those techniques are summarized as follows:

1. Combine Milestones 0 and I (Skip Concept Exploration (CE) Phase)
2. Combine Milestones I and II (Skip Demonstration/Validation (Dem/Val) Phase)
3. Combine Milestones I and III (Skip Dem/Val and Engineering & Manufacturing Development (EMD) Phases)
4. Combine Dem/Val Development Test (DT) and Operational Test (OT)
5. Conduct concurrent (overlapping) Dem/Val DT and OT
6. Combine EMD DT and Initial Operational Test & Evaluation (IOT&E)
7. Conduct concurrent (overlapping) EMD DT and IOT&E
8. Conduct Customer Tests in lieu of a formal Development Test in Dem/Val
9. Conduct Customer Tests in lieu of a formal Development Test in EMD
10. Conduct user evaluation in lieu of formal IOT&E in EMD Phase
11. Request Milestone Decision Authority delegate Milestone Decision Review Chairmanship to RDEC Management
12. Request DA-Directed Procurement prior to Type Classification-Standard

13. Staff Milestone Decision Package prior to receipt of Independent Evaluation/Assessment Reports (IER/IAR), with reports expected prior to the decision meeting
14. Use Interim Assessment or Evaluation Reports to support a Milestone Decision, with decision contingent upon favorable Final Reports
15. Use Independent Evaluator Briefing in lieu of written reports to support a Milestone Decision, with written report(s) to follow
16. Waive requirement for a Cost and Operational Effectiveness Analysis (COEA)
17. Waive requirement for a separate System Threat Assessment Report (STAR)
18. Waive requirement for a separate Logistics Demonstration
19. Utilize Test Integration Working Group (TIWG) as Electromagnetic Environmental Effects (E3) Requirements Board
20. Conduct abbreviated Logistics Support Analysis and Reporting (LSA/LSAR)
21. Don't prepare separate Configuration Management Plan
22. Don't generate Independent Life Cycle Cost Estimate
23. Obtain Milestone Decision Authority approval to solicit a contract prior to Milestone Decision Review
24. Utilize a single contract for Dem/Val and EMD
25. Utilize a single contract for EMD and First Production
26. Conduct production First Article Tests to validate development deficiency corrections
27. Validate technical manuals/support system during first production instead of during EMD

Most of these 27 techniques are self-explanatory. The few that require further explanation are described as follows:

Techniques 8 and 9 - Conduct Customer Tests in lieu of a formal DT in Dem/Val and EMD. Here, Customer Tests are defined as tests conducted by the development tester, Test and Evaluation Command (TECOM), that are based solely on the direction provided by the materiel developer. For these techniques, Customer Tests do **not** refer to those conducted with operational testing issues. The materiel developer is the customer of TECOM in this case. This differs from formal DT where the basis for the test is a requirements document. Customer tests are typically used in early development to evaluate concepts and they are usually less expensive than comparable DT because of lower instrumentation and oversight requirements. However, the results may not meet the needs of the user.

Technique 10 - Conduct user evaluation in lieu of formal IOT&E in EMD Phase. A user evaluation is defined as use of a developmental system by real field units in an actual field exercise, with non-intrusive methods of data collection such as interviews following the exercise. Formal IOT&E, on the other hand, is defined as use of a developmental system by representative soldiers in a field exercise created specifically to evaluate the performance of the new system. IOT&E is substantially more costly than a user evaluation, but it can also result in substantially more useful data on the performance of a developmental system.

Technique 12 - Request DA-Directed Procurement prior to Type Classification-Standard. In cases where fielding of a developmental system is urgently required and the development process has not been completed, DA has the option to direct the immediate procurement of the item. This would then be followed by completion of formal development and the retrofitting of any required changes into the previously fielded systems.

Technique 19 - Utilize Test Integration Working Group (TIWG) as Electromagnetic Environmental Effects (E3) Requirements Board. The requirement for an E3 Requirements Board for all Army development programs was recently directed by AMC. Since the agencies and individuals necessary for both the E3 Board and the already existing TIWG are almost identical, combining of the two would save on the number of separate committees involved in oversight of a program.

Technique 26 - Conduct production First Article Tests to validate development deficiency corrections. For most development programs, any serious system deficiencies uncovered during EMD must be corrected, and the corrections validated before the Army is willing to enter production. The validation could consist of an extra evaluation/test prior to conducting the Milestone III Decision Review. First Article Testing validates the adequacy of production units before allowing full rate production to begin, using the first units produced by the production contractor. It usually retests many of the same functions as would be required to validate development deficiency corrections. Therefore, if the

MDA is willing to accept the Milestone III Decision prior to the validation of the deficiency corrections, they could be validated during FAT.

A hypothetical example of streamlining of an ACAT IV program would be as follows: The manager may consider the technical risk of the system that is to be developed to be low enough to allow for a combined Milestone I and II, moving the project directly from Concept Exploration (CE) into the Engineering and Manufacturing Development (EMD) phase. The risk of this approach is that the system will not be sufficiently mature for EMD, resulting in rework and delays and/or less than desired performance. But the manager must balance this risk with the need to field the new system by a prescribed date (for instance, driven by the end of the useful life of the existing system). Streamlining provides the best management plan given the urgency of the schedule and the relatively low risk.

D. CHAPTER SUMMARY

The new DoD 5000 series of acquisition management regulations concentrates on the management oversight required for large ACAT I programs. The regulations outline the processes required of ACAT I managers, and encourages tailoring, or streamlining of the process by ACAT II, III, and IV managers, while not allowing for across-the-board Service-level policies. Individual managers need to streamline to effectively manage their program's risk, but they lack key data necessary for conducting proper risk assessments. This study seeks to provide this missing risk assessment data.

III. METHODOLOGY

The methodology utilized for this effort was a management problem analysis using both quantitative and qualitative techniques. The qualitative techniques involved the use of personal and telephonic interviews to determine the opinions of the acquisition policy Subject Matter Experts from each of the AMC Commands concerning the validity and breadth of the techniques to be investigated. The information from this process was assimilated into a broad-based questionnaire that was distributed Army-wide to all ACAT IV development managers, with questions that required numeric and essay responses. The numeric responses were quantitatively analyzed, and the essay responses were used to find elaboration/causal relationships for specific responses and/or trends observed in the data.

A. RESEARCH PROCESS STEPS

1. Telephonic interviews were conducted with individuals within AMC, the Department of Army Headquarters, and the AMC MSCs to develop a list of MSC/RDEC acquisition policy points of contact (POCs) for ACAT IV programs. The individuals identified were either the Command's overall acquisition policy POC, or a senior manager charged with management of all ACAT IV programs for that Command. The individuals are listed in Appendix A.
2. Telephonic interviews were conducted to:
a. Develop a valid list of streamlining techniques used by ACAT IV managers, for use as a basis for questionnaires to ACAT IV managers.
b. Identify ACAT IV project managers' names and addresses to survey. Development of this list was necessary because ACAT IV programs are not all tracked by AMC. Therefore, the only way to obtain a comprehensive list was to call into each Command and search out an individual or individuals knowledgeable on the subject who had access to the names and addresses of the ACAT IV managers. A total of seventy-seven individuals were identified as ACAT IV managers. For all Commands except the Missile Command (MICOM) and the Aviation Applied Technology Directorate (AATD) of the Aviation and Troop Command, specific names and addresses were identified. For MICOM and AATD, since only one senior manager within each Command was in charge of all ACAT IV programs, the POCs noted above agreed to distribute the questionnaires.
3. Using the streamlining techniques previously listed, and the U.S. Army Research Institute for the Behavioral and Social Sciences Questionnaire

Construction Manual, an appropriate survey questionnaire for the study was constructed. See Section B for the specifics of the questionnaire development process and Appendix B for a copy of the questionnaire.[Ref. 23]

4. Draft questionnaires were provided to the MSC/RDEC acquisition policy POCs for their review and comment. Since these individuals are their Command's acquisition policy "experts", their responses helped refine the document and served as a check that the questionnaire was complete and understandable before surveying their ACAT IV managers. The POCs were not surveyed further.

5. The questionnaires were sequentially numbered for control purposes and mailed to each of the ACAT IV managers that were previously identified. The mailing included a personally addressed and individually signed cover letter requesting participation, stating the purpose of the study, and articulating the voluntary, confidential and not-for-attribution nature of the study. Additionally, each package contained a return addressed, postage paid, Government reply envelope. Four weeks were allowed for responses.

6. Finally, the data was compiled and analyzed as discussed in Chapter V.

B. QUESTIONNAIRE DEVELOPMENT

A quantitative questionnaire with provisions for subjective comments, reproduced in Appendix B, was prepared as the survey instrument. It is structured in two parts. The first part focuses on the size of the projects managed by the respondent, to allow for categorization of responses by size. The second part addresses the respondents opinions regarding DoD 5000 streamlining techniques. The questionnaire structure chosen was an ordinal, Likert scale, with compound questions: a binary set and two five point adjectival questions. The following scale was employed for the adjectival questions regarding cost savings and schedule reduction potential. This non-linear scale was chosen to be able to differentiate among the levels of savings for the lowest, as well as the highest, saving techniques:

Rating	**1**	**2**	**3**	**4**	**5**
Cost Savings	\$0-\$100	\$100-\$1000	\$1K-\$10K	\$10K-\$100K	>\$100K
Schedule Reduction	0-7 days	1-4 wks	1-6 mos	6-18 mos	>18 mos

From the referenced questionnaire manual, these selections best fit the type of questions and data being addressed in this research effort. For example, the reference states that ordinal Likert scales are the preferred and most widely used type when multiple choice responses are required and the distance between each scale point isn't assumed to be equal. In addition, it is the preferred scale when the categories are mutually exclusive and exhaustive, as the list of streamlining initiatives should be. Five point scales are the most common and within the range of breakouts that yields roughly equal responses. The scale will be fully labeled, as this is noted in the reference to provide less skewed results. This should provide an understandable and statistically useful range of options.[Ref. 24]

The questionnaire addressed the research questions as outlined in the following dendritic process:

Subsidiary Research Question 1: How do Army Commands streamline ACAT IV programs differently?

Criteria: For each Command, what are the most frequently used streamlining techniques?

Measure of Effectiveness: For each Command, what techniques are used?

Data Requirement: Techniques used by each Command.

Data Source: Survey Question a.

Measure of Effectiveness: For each Command, what is the frequency of use of each technique?

Data Requirement: Number of times each technique is used by each Command.

Data Source: Survey Question a.

Criteria: What factors cause each Command to use certain techniques (as compared to others)?

Measure of Effectiveness: For the ACAT IV managers in each Command, why was a technique chosen?

Data Requirement: Manager comments on factors leading to a decision.

Data Source: Survey Question a. comments.

Subsidiary Research Question 2: How do the various streamlining techniques compare with respect to program cost savings?

Criteria: For each technique, what is the program cost savings?

Measure of Effectiveness: For each size program what is the distribution of cost savings ratings among the streamlining techniques?

Data Requirement: Ratings of cost savings associated with each technique.

Data Source: Survey Question b.

Criteria: What factors cause each manager to utilize certain techniques (as compared to others)?

Measure of Effectiveness: For each manager, why was a rating chosen?

Data Requirement: Manager comments on factors leading to a decision.

Data Source: Survey Question b. comments.

Subsidiary Research Question 3: How do the various streamlining techniques compare with respect to program schedule reduction?

Criteria: For each technique, what is the program schedule reduction?

Measure of Effectiveness: For each size program what is the distribution of schedule reductions ratings among the streamlining techniques?

Data Requirement: Ratings of schedule reductions associated with each technique.

Data Source: Survey Question c.

Criteria: What factors cause each manager to utilize certain techniques (as compared to others)?

Measure of Effectiveness: For each manager, why was a rating chosen?

Data Requirement: Manager comments on factors leading to a decision.

Data Source: Survey Question c. comments.

The survey conducted utilizing the questionnaire, as part of this study's methodology, resulted in quantitative and narrative data concerning the streamlining techniques being investigated. In the next chapter the data will be reviewed, tabulated and presented for analysis.

IV. DATA PRESENTATION

In support of this thesis, 74 questionnaires were distributed to the ACAT IV development managers at various U.S. Army Commands to inquire about their use of program streamlining techniques for ACAT IV development programs. Initially there were 16 responses. After follow-up inquiries, it was discovered that 35 individuals were inappropriate survey subjects, so the number of potential respondents was reduced to 39 and a final total of 19 responses were obtained. Some Commands provided limited or no responses.

The two Commands that did not respond were CECOM and MICOM. Since these two cases of nonresponsiveness appeared to represent systemic problems, the Command ACAT IV acquisition policy POCs (Appendix A) were queried about the lack of responses, instead of directly contacting individual ACAT IV managers. The discussions with these POCs revealed a difference with the way smaller-sized development programs are managed for the commodities associated with CECOM and MICOM. This difference was not readily apparent during earlier discussions. Specifically, both Commands use managers who are not certified Program Managers to conduct the early development phase of programs, which, as pointed out earlier, automatically categorizes them as ACAT IV. What is unique to these two Commands is that **all** of their programs transition to ACAT III, or higher status early in development by having management responsibility transferred to a certified Program Manager (PM) within the Program Executive Officer (PEO) chain-of-command. This also happens for some but not all programs at the other AMC Commands. Therefore, the ACAT IV managers within CECOM and MICOM do not get very involved in the DoD 5000 policies, most of which are not applicable early in the development process, and the managers had no experience base with which to respond to the survey. The CECOM POC stated:

> The survey you supplied seems to be directed more to the type of acquisition done at Natick. Here at CECOM, a program goes through the early stages of development, funded by 6.2, 6.3 R&D funds. When a program is ready for 6.4 funding (the EMD phase), it transitions to a PEO

> portfolio.... ACAT IV, by definition, means the system is managed by other than a board selected Program Manager. Therefore, a system that starts as an ACAT IV can then become an ACAT III when it transfers to a PM under a PEO.

Given this difference, these two Commands fall outside of the scope of the survey since it keyed on ACAT IV development managers and the policies of DoD 5000. Thereby, the number of potential survey respondents is appropriately reduced to 39. However, the difference in management philosophies between these two Commands and the other four is of interest, and the Analysis Chapter includes a comparison based on the information revealed in the study and the researcher's experience.

Follow-up discussions with non-responsive managers from the other Commands revealed a number of points regarding the questionnaire and the researcher's assumptions. Assumptions concerning the managers' willingness to participate and their knowledge of the DoD 5000 development process were not valid for all ACAT IV managers. Also, a number of managers did not consider themselves qualified to respond due to their lack of experience with the entire process (which can take long enough that many managers have not experienced all or much of it in their careers), and/or lack of knowledge of the processes being proposed for streamlining. Some of the individuals contacted were not familiar with the DoD 5000 terminology, and this created a barrier to their understanding of the proposed streamlining techniques.

Given the above, the data that was received is deemed to be valid. The respondents are still assumed to be knowledgeable and any conclusions drawn valid. A limitation is created as it will be difficult to establish statistical significance for the results, since the quantity of observations is lower than expected. Therefore, the analysis will be conducted on a qualitative, rather than predominately quantitative, basis.

A. DATA TABULATION

As the questionnaire were received from the respondents, the data was loaded in two databases. The quantitative responses to the survey were tabulated in a Minitab

database and the narrative responses were tabulated by question number in a Wordperfect text database. The raw data is available in Appendices C and D for the quantitative and narrative data respectively.

B. DATA PRESENTATION

For the first research sub-question (How do Army Commands streamline ACAT IV programs differently?), the Command-by-Command comparison, the quantitative responses are summarized in Table 1. For each Command that was queried in the survey, the table depicts the total number of respondents, as well as the number and proportion of the respondents who responded positively regarding their awareness of each of the streamlining techniques. Note the low number (two) of respondents from both AATD and ERDEC, as well as the lack of responses from AATD, ERDEC, and TARDEC (zeros in the "# Yes" and "% Yes" columns) for a number of techniques. One aspect of the Analysis Chapter will be investigation of each of these non-response areas, to ascertain whether the Commands were aware of the technique or not.

For the second and third research sub-questions (How do the various streamlining techniques compare with respect to program cost savings?) and (How do the various streamlining techniques compare with respect to program schedule reduction?), the Technique-by-Technique comparisons, the quantitative responses are summarized in Table 2. The five categories for total program RDTE cost, and the seven categories for development durations, established in the survey were consolidated in the table into two categories (small and large programs), to provide clarity for evaluation. This was necessary because the number of categories established during questionnaire development became inappropriate, due to the small number of survey responses in each category. Large programs were defined for purposes of the analysis as those requiring $7 million or more of RDTE funding (for the cost comparisons) and 3 years or more to complete development (for the schedule comparisons). For each size program, the table depicts the total number of respondents for both cost savings and schedule reduction, as well as the number of respondents who replied regarding each technique and an average of the

ACAT IV Streamlining Techniques Frequency of Use by Command

Command	Natick		AATD		ERDEC		TARDEC	
No. of Respondents	9		2		2		6	
Streamlining Technique	# Yes	% Yes	# Yes	% Yes	# Yes	% Yes	# Yes	% Yes
1	7	0.8	2	1.0	1	0.5	4	0.7
2	9	1.0	2	1.0	2	1.0	3	0.5
3	6	0.7	0	0.0	2	1.0	2	0.3
4	9	1.0	0	0.0	2	1.0	4	0.7
5	5	0.6	2	1.0	2	1.0	3	0.5
6	5	0.6	1	0.5	2	1.0	1	0.2
7	3	0.3	2	1.0	2	1.0	2	0.3
8	5	0.6	1	0.5	2	1.0	0	0.0
9	3	0.3	0	0.0	2	1.0	0	0.0
10	6	0.7	2	1.0	2	1.0	1	0.2
11	7	0.8	1	0.5	0	0.0	3	0.5
12	4	0.4	1	0.5	0	0.0	0	0.0
13	8	0.9	2	1.0	2	1.0	4	0.7
14	7	0.8	2	1.0	2	1.0	4	0.7
15	5	0.6	1	0.5	1	0.5	3	0.5
16	7	0.8	2	1.0	1	0.5	2	0.3
17	6	0.7	1	0.5	2	1.0	3	0.5
18	8	0.9	0	0.0	2	1.0	2	0.3
19	4	0.4	2	1.0	1	0.5	2	0.3
20	3	0.3	1	0.5	2	1.0	2	0.3
21	3	0.3	1	0.5	2	1.0	0	0.0
22	2	0.2	0	0.0	1	0.5	1	0.2
23	6	0.7	1	0.5	1	0.5	1	0.2
24	8	0.9	1	0.5	2	1.0	3	0.5
25	7	0.8	1	0.5	2	1.0	1	0.2
26	6	0.7	2	1.0	2	1.0	2	0.3
27	4	0.4	2	1.0	2	1.0	3	0.5

Table 1. Frequency of Use by Command

Projected Savings by Program Size

	Cost Savings *				Schedule Reduction **			
	Small Programs ($0-$7MIL RDTE)		Large Programs (>$7MIL RDTE)		Small Programs ($0-$7MIL RDTE)		Large Programs (>$7MIL RDTE)	
No. of Respondents	10		9		5		14	
Streamlining Technique	No. of Observations	Avg Rating	No. of Observations	Avg Rating	No. of Observations	Avg Rating	No. of Observations	Avg Rating
1	7	3.1	9	4.6	4	3.5	12	3.9
2	7	3.9	9	5	4	3.8	12	4.3
3	7	4.3	4	5	4	3.8	7	4.6
4	9	4	5	4.6	3	3.3	11	3.4
5	7	2.9	6	3.7	3	3	9	3.1
6	5	3.2	5	4.8	1	4	8	3.8
7	5	3.2	6	3.8	3	3.3	8	3.4
8	4	2.8	6	3.3	1	4	8	2.9
9	3	2.7	4	3.3	0	0	6	3
10	4	3.8	6	4.5	1	2	8	3
11	3	2.7	6	2.7	3	3.3	7	2.9
12	0	0	4	1.8	1	2	3	3
13	7	1.9	6	1.7	3	2.3	12	2.5
14	7	1.9	6	1.8	4	2.3	12	2.6
15	4	1.3	6	1.7	2	2	9	2.4
16	3	3.3	6	3.5	2	2	7	3.1
17	1	1	7	2.4	3	2.7	5	3.2
18	5	3.8	5	4	2	3.5	8	3
19	2	2	3	1.7	2	1.5	3	2.7
20	4	3.8	3	4.3	2	3	5	3.2
21	3	3	2	3.5	1	3	4	2.8
22	1	3	2	3	1	3	2	2.5
23	3	2.7	5	1.8	1	3	8	3.4
24	6	2.8	4	4	1	3	10	4.1
25	3	3.7	6	4.3	1	3	9	4.2
26	2	4	6	3.5	2	3.5	8	3.5
27	2	2.5	5	3.2	0	0	7	2.5

Notes:	Rating	1	2	3	4	5
*	Cost Savings	$0-$100	$100-$1K	$1K-$10K	$10K-$100K	>$100K
**	Schedule Reduction	0-7 days	1-4 weeks	1-6 months	6-18 months	>18 months

Table 2. Projected Savings by Program Size

savings **ratings** provided by these respondents. In order to qualitatively evaluate the results of the survey, the ratings of the individual respondents were averaged to: (1) obtain small to large program trends in the savings associated with the various techniques, and (2) establish which techniques have the very highest and lowest savings (in terms of cost and schedule) for small and large programs. The average ratings do **not** represent expected savings. The scale is not linear and the response rates are too low to provide confidence in the point estimates. The rating scale used in the survey is provided at the bottom of the table for reference.

The following Analysis Chapter utilizes the data in Tables 1 and 2 to investigate differences between the usage levels of Natick and a combination of the other Commands. In addition, differences between the cost savings and schedule reduction potential of small and large programs are analyzed.

V. ANALYSIS

This analysis is based on comparisons of the most prevalent streamlining techniques and those that had the highest and lowest savings, with respect to cost and schedule. The lowest saving techniques are being evaluated because a number of them were both low in savings and high in use. This indicates that they may be valuable for other reasons, or their implementation is so easy as to be routine. The narrative responses are used to provide "cause-and-effect" reasons for similarities and differences among Commands and among techniques (in terms of their frequency of use and the expected level of cost savings and schedule reduction).

A review of the narrative comments regarding three of the techniques led to their subsequent elimination for further analysis. The three techniques are

Technique 8.	Conduct Customer Tests in lieu of a formal Development Test in Dem/Val
Technique 9.	Conduct Customer Tests in lieu of a formal Development Test in EMD
Technique 23.	Obtain Milestone Decision Authority approval to solicit a contract prior to Milestone Decision Review

The first problem, regarding Techniques 8 and 9 (Conducting Customer Tests in lieu of formal DT) concerned varying definitions for the term "customer test". The intended definition was a TECOM test conducted without formal documentation and planning, where the materiel developer is the customer. Many respondents from Commands other than Natick responded as if "customer testing" meant "user testing", which was addressed in Technique 10 (Conduct user evaluation in lieu of formal IOT&E in EMD phase). The varying interpretations of the definition of customer testing makes any comparisons based on these techniques invalid. For Technique 23 (Obtain MDA approval to solicit a contract prior to Milestone Decision Review) the narrative comments from the survey participants indicated that some respondents misread the technique and they addressed it as if it proposed awarding the contract, vice soliciting it. The question

did not intend to address the award of a contract prior to the Review. Given this, the responses are not clearly differentiated and the information is not clear. Therefore, the analysis ignores Techniques 8, 9, and 23.

A. COMMAND-BY-COMMAND COMPARISON

1. Command Awareness of Techniques

The first Measure of Effectiveness addressed the question of whether all the Commands were aware of all of the techniques. From the data in Table 1, there are seven techniques that were not considered by any of the respondents for at least one Command.

Technique 3.	Combine Milestones I and III (Skip Dem/Val and Engineering & Manufacturing Development (EMD) Phases)
Technique 4.	Combine Dem/Val Development Test (DT) and Operational Test (OT)
Technique 11.	Request Milestone Decision Authority delegate Milestone Decision Review Chairmanship to RDEC Management
Technique 12.	Request DA-Directed Procurement prior to Type Classification-Standard
Technique 18.	Waive requirement for a separate Logistics Demonstration
Technique 21.	Don't prepare separate Configuration Management Plan
Technique 22.	Don't generate Independent Life Cycle Cost Estimate

Because the questionnaires were targeted to specific individuals, the non-responses concerning these techniques may not indicate that the Command was not aware of the technique, but only that the individuals responding were not. In addition, some individuals who did not check the survey block to indicate that they were aware of a technique did, however, provide narrative comments regarding the same technique. Given this, a review of the survey narrative comments for these seven techniques revealed the following specific information:

For Techniques 3 (Combine Milestones I and III) and 4 (Combine Dem/Val DT and OT), AATD did not have any positive responses. However, evaluation of their

narrative responses revealed that they were aware of the techniques and that they have sometimes used them. Specific comments were:

> Technique 3 - Off-the-shelf or low risk technology are ideally suited for combining I and III for an ACAT IV program.
>
> Technique 4 - Off-the-shelf items should not need very much DT/OT testing because of the low technology risks.

For Techniques 11 (Request MDA delegate Milestone Decision Review Chairmanship to RDEC management), 12 (Request DA-Directed Procurement prior to Type Classification-Standard), 21 (Don't prepare separate Configuration Management Plan), and 22 (Don't generate Independent Life Cycle Cost Estimate) various Commands did not have any positive responses, but their narrative comments revealed an awareness of the technique. In addition, their comments expressed disagreement with use of the technique as the reason they did not respond positively to the survey question. Comments included:

> Technique 11. - Like having the General Officer sign it.
> Technique 21. - Configuration Management Plan must be specific to parties involved.

For Technique 18 (Waive requirement for a separate Logistics Demonstration) AATD did not have any positive responses. A review of their narrative responses indicated agreement with the intent of the technique, but there was no indication of whether or not they were aware of the idea prior to the survey.

In general, for the seven techniques that were not considered by any of the respondents from a particular Command, all of the individuals who did not respond provided narrative comments and in all but one case, the Command was aware of the technique. Negative responses were due to disagreement with the use the technique, not lack of awareness of the technique. The one technique where the narrative responses left it unclear as to whether AATD was aware of the technique (Waiving the Logistics

Demonstration), remains unknown. However, out of five Commands and 25 techniques (125 categories) only one category remained unresolved as to the Command's awareness of a technique.

All of the Commands are aware of all of the identified, available techniques. Any methods of cross-fertilization transmission are unknown. They may be independently concluding the same things, or they could be receiving suggestions from acquisition team members who are members of teams from different Commands (such as TRADOC schools, TECOM, AMC HQ, etc.). Regardless of the method being employed, the researcher's concern that cross-fertilization was not taking place and certain Commands were unaware of specific streamlining techniques has proven to be invalid.

2. Highest Usage Techniques

To evaluate the second Measure of Effectiveness, comparing usage levels across techniques and Commands, the Natick responses were compared to those of all other Commands combined (labeled "non-Natick" throughout this document), see Table 3. As a result of combining non-Natick responses, the analysis of Natick operations is more thorough than any other Command. This was felt to be the most useful approach to data analysis, due to the limited responses by the non-Natick Commands. First, an overall comparison of Natick to non-Natick responses will be conducted, followed by a more in-depth evaluation of the techniques with the highest response frequencies for Natick and non-Natick. As a result, a number of interesting correlations are revealed.

Overall Comparison - Figure 4 compares the frequency of use established for each technique for Natick and non-Natick respondents. The chart reveals general agreement between the two groups, with a consistently slightly higher usage for the Natick group. One possible reason for the consistent difference may be a bias created during the establishment of the streamlining techniques for the study. The researcher is from Natick and a number of the techniques listed in the survey were posed as a direct result of acquisition policy issues recently discussed at Natick, and, therefore, the Natick respondents may have been more familiar with the wording in the survey.

ACAT IV Streamlining Techniques Frequency of Use				
	Natick		Other Commands' Total	
No. of Respondents	9		10	
Streamlining Technique	# Yes	% Yes	# Yes	% Yes
1	7	0.8	7	0.7
2	9	1.0	7	0.7
3	6	0.7	4	0.4
4	9	1.0	6	0.6
5	5	0.6	7	0.7
6	5	0.6	4	0.4
7	3	0.3	6	0.6
8	5	0.6	3	0.3
9	3	0.3	2	0.2
10	6	0.7	5	0.5
11	7	0.8	4	0.4
12	4	0.4	1	0.1
13	8	0.9	8	0.8
14	7	0.8	8	0.8
15	5	0.6	5	0.5
16	7	0.8	5	0.5
17	6	0.7	6	0.6
18	8	0.9	4	0.4
19	4	0.4	5	0.5
20	3	0.3	5	0.5
21	3	0.3	3	0.3
22	2	0.2	2	0.2
23	6	0.7	3	0.3
24	8	0.9	6	0.6
25	7	0.8	4	0.4
26	6	0.7	6	0.6
27	4	0.4	7	0.7

Table 3. Frequency of Use, Natick vs. Other Commands Total

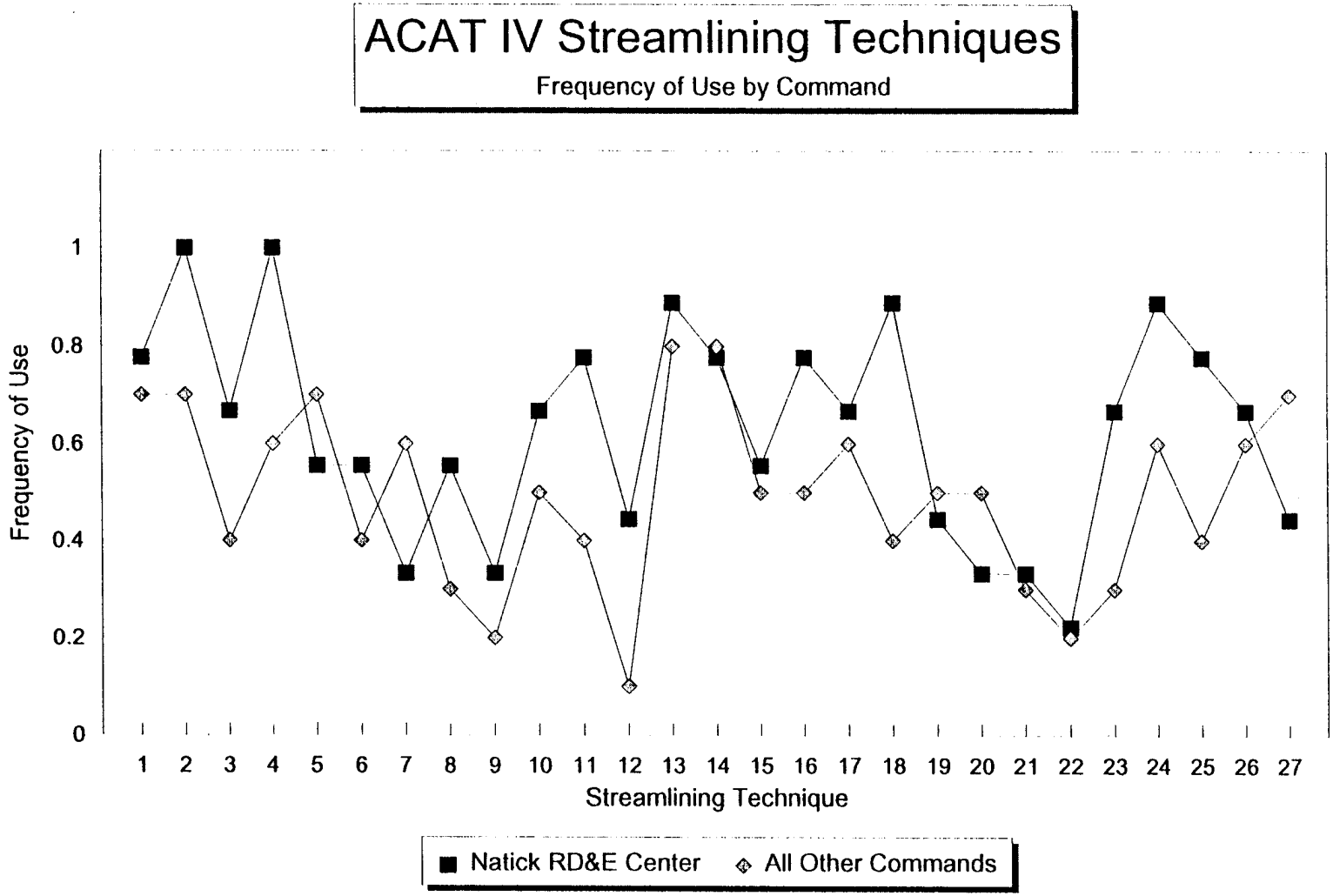

Figure 4. Frequency of Use by Command

The following is a review of each of the techniques with the highest differences, analyzing the differences between the two groups:

For Technique 4 (Combine Dem/Val DT and OT) the non-Natick respondents expressed lower usage for three reasons: (1) they disagreed with the use of the technique because of its high risk and they felt that independent operational tests were necessary to remove developer biases, (2) they considered it too difficult to accomplish, citing problems with obtaining agreement from testers and evaluators, and (3) commodity specific concerns (such as the artillery ammunition not typically requiring OT and the man-firing of munitions prior to accomplishing significant DT). Note that non-Natick usage was still fairly high (it was a high usage technique for both groups).

Technique 11 (Request MDA delegate Milestone Decision Review Chairmanship to RDEC management) is broadly applied at Natick. The non-Natick respondents expressed lower usage for two reasons: (1) they disagreed with the use of the technique because they preferred that a General Officer sign the minutes/decision, or because they did not consider the developer unbiased enough to chair the Review, and (2) the recent establishment of the new Command structure within AMC (including the consolidation of ARDEC and portions of Belvoir RDEC as parts of TARDEC) left it as an unresolved issue for some respondents at this point. One possible reason for its high usage at Natick is that the MDA is remotely located at ATCOM in St. Louis. However, Natick is not unique in being remotely located from the MDA. Both AATD and the parts of TARDEC that were surveyed are also located away from their MDAs. One unique organizational difference is that the Natick MDA at ATCOM is predominately concerned with aviation items. The lack of direct involvement in the items under development at Natick could provide an explanation for the high interest in having the Review Chairmanship at Natick. Interestingly, the recent change that places Natick under a new MSC, Soldier Support Command (SSCOM), which is co-located at Natick, may change this opinion to one expressed by a respondent from ERDEC: "Like having General Officer sign it".

Technique 18 (Waive requirement for a separate Logistics Demonstration) is a program requirement monitored and enforced by the Army Materiel Systems Analysis

Activity (AMSAA). According to the narrative comments, for non-Natick commodities, the demonstration is not required in many cases (for ammunition for instance).

For Technique 25 (Utilize a single contract for EMD and First Production) the non-Natick respondents disagreed with the use of the technique. Some of the comments were:

> Cost factors not fully known until the EMD build.
> Should foster competition in production.
> TDP should be proven in production by another source.

These comments express a concern with selection of a production contractor based on cost estimates generated in Dem/Val and the opinion that it is in the Government's best interest to have competition in the first production.

Overall, the techniques with the greatest differences in usage rates between Natick and non-Natick respondents were due to disagreements about the value of the techniques and their inherent risk levels, as well as commodity and command structure related differences.

Highest Usage Comparison - To analyze Table 1, it was decided to comparatively analyze the highest usage rate techniques for the Natick and non-Natick groups. Tables 4 and 5 outline the streamlining techniques that received the highest response rates. The ten techniques with the highest Natick usage and the eleven techniques (there was no distinction between usage rates of the tenth and eleventh highest) with the highest non-Natick usage are presented for comparison, to investigate similarities, differences and the reasons for their high usage.

Common Techniques - As depicted in Tables 4 and 5, of the high ten or eleven techniques of the two groups, six are common to both groups. These will be analyzed individually for the reasons for their high usage and commonality.

The reasons for the high usage of Technique 1 (Combine Milestones 0 and I) were the low risk and high technological maturity of ACAT IV programs. Specific comments included "Items always of low technical risk and do not warrant concept

ACAT IV Streamlining Techniques

Frequency of Use by Command, Highest Natick and Non-Natick Responses

Shading = Common Techniques

Natick	All Other Commands
1. Combine Milestones 0 and I (Skip CE Phase)	1. Combine Milestones 0 and I (Skip CE Phase)
2. Combine Milestones I and II (Skip Dem/Val Phase)	2. Combine Milestones I and II (Skip Dem/Val Phase)
4. Combine Dem/Val Development and Operational Testing	4. Combine Dem/Val Development and Operational Testing
11. Request Milestone Decision Authority delegate Milestone Decision Review Chairmanship to RDEC Management	5. Conduct concurrent Dem/Val Development and Operational Testing
13. Staff Milestone Decision Package prior to receipt of Independent Evaluation/Assessment Reports	7. Conduct concurrent (overlapping) EMD DT and IOT&E
14. Use Interim Assessment or Evaluation Reports to support a Milestone Decision	13. Staff Milestone Decision Package prior to receipt of Independent Evaluation/Assessment Reports
16. Waive requirement for a Cost and Operational Effectiveness Analysis (COEA)	14. Use Interim Assessment or Evaluation Reports to support a Milestone Decision
18. Waive requirement for a separate Logistics Demonstration	17. Waive requirement for a separate System Threat Assessment Report (STAR)
24. Utilize a single contract for Dem/Val and EMD	24. Utilize a single contract for Dem/Val and EMD
25. Utilize a single contract for EMD and First Production	26. Conduct production First Article Tests to validate development deficiency corrections
	27. Validate technical manuals/support system during first production instead of during EMD

Table 4. Frequency of Use by Command

ACAT IV Streamlining Techniques

Frequency of Use by Command

Highest Natick and Other Commands' Responses

Command	Natick		Other Commands Total	
No. of Respondents	9		10	
Streamlining Technique	# Yes	% Yes	# Yes	% Yes
1	7	0.8	7	0.7
2	9	1.0	7	0.7
4	9	1.0	6	0.6
5	5	0.6	7	0.7
7	3	0.3	6	0.6
11	7	0.8	4	0.4
13	8	0.9	8	0.8
14	7	0.8	8	0.8
16	7	0.8	5	0.5
17	6	0.7	6	0.6
18	8	0.9	4	0.4
24	8	0.9	6	0.6
25	7	0.8	4	0.4
26	6	0.7	6	0.6
27	4	0.4	7	0.7

Shading = Highest Usage for Each Group

Table 5. Frequency of Use, Highest Responses

exploration" and "Small programs usually don't need to prove out technology to the extent of more complex ones". Systemic problems with the development process were noted as driving the decision to combine the Milestones as well. It was noted that Milestone 0 cannot be conducted without an approved Mission Needs Statement (MNS) and that pressures to develop items quickly necessitate initiating development prior to the receipt of the approved MNS. The idea is to obtain sufficient progress by the time the MNS is approved to conduct the Milestone I Decision Review. In addition, in many low tech/low risk programs, the activities required for Milestones 0 and I are almost synonymous.

The reasons cited for the high usage of Technique 2 (Combine Milestones I and II) were also risk related. The use of a single build/test phase fits the needs of most ACAT IV programs, because they are frequently modified NDI efforts. A key factor noted in the selection of this technique was the degree of success in the Concept Exploration Phase and the demonstration of the required technologies. The technique is used because it saves a great deal of funding and program time. Respondents from one Command, TARDEC, disagreed with its use citing that there was no reason to assume the additional risks when, in their view, the test costs were low. The implication was that Dem/Val is necessary to avoid costly problems in EMD. This difference may be due to commodity differences, or differing degrees of risk acceptance.

Technique 4 (Combine Dem/Val DT and OT) was frequently used because ACAT IV programs are relatively simple and have few operational issues. The respondents felt that DT with user troops was sufficient to identify and verify user issues. However, even though the technique had high usage, there were difficulties associated with implementation. Specific concerns were "Often difficult to get OEC and TEXCOM to agree" and "Ability to get concurrence from DT and OT testers/evaluators". An additional programmatic concern noted was that Operational Requirements Document (ORD) approval is required approximately one year prior to the start of OT. This could create a situation where DT is held up, awaiting the ORD, if a combined test were planned.

Techniques 13 (Staff Milestone Decision Package prior to receipt of Independent Evaluation/Assessment Reports) and 14 (Use Interim Assessment or Evaluation Reports to support a Milestone Decision) address the same fundamental issue and the reasons for their high usage are the same. The issue is that programs approaching a Milestone Decision have time-lines that require specific Review support documentation, and the conduct of the Review often falls in a shorter timeframe than the evaluators/assessors can support with fully staffed and coordinated formal reports. Reasons cited by the respondents keyed on the need to meet the Milestone date and award follow-on contracts. They emphasized that use of these techniques presented little risk, since the "results are usually known long before the final report". It was interesting to note that the narrative comments keyed on the time saved and low risk, but did not indicate that the respondents felt that the evaluators/assessors took too long. This is surprising since the evaluations are usually on the critical path leading up to the Decision Review, and the relationship between the development managers and evaluators is typically adversarial.

Technique 24 (Utilize a single contract for Dem/Val and EMD) was cited as a very large saver of funding and time, while actually lowering the risks associated with two contracts (award problems, transfer of knowledge/technologies, etc.). One respondent noted:

> Regarding ACAT IV programs, the time to complete Dem/Val may be the time to award a contract. Purpose of separating is to bring a complex effort into manageable pieces thereby reducing risk. In ACAT IV we usually have much less complexity and are able to manage the Dem/Val and EMD with less risk and greater ease.

This appears to be an almost universally accepted strategy when the program includes both the Dem/Val and EMD phases. However, difficulties arise when trying to write a sufficiently detailed Scope of Work early in Dem/Val, given that specific requirements may not yet be fully defined.

Unique Techniques - In the top ten/eleven usage techniques, there were four that were unique to Natick and five that were unique to the other Commands. Each of these will be evaluated for reasons for the differences.

Natick Unique Techniques - Technique 11 (request MDA delegate Milestone Decision Review Chairmanship to RDEC management) was unique to Natick. This technique was analyzed earlier as having one of the largest usage differences between Natick and non-Natick respondents. Reasons for the differences are cited previously.

Technique 16 (Waive requirement for a COEA) was unique to Natick, but the narrative comments from the other Commands also supported the technique. The COEA was generally considered too costly and inaccurate. The only difference was that a number of the non-Natick respondents felt that the decision was up to TRADOC, and they were not authorized to decide. Therefore, they did not respond positively.

Technique 18 (Waive requirement for a separate Logistics Demonstration) was unique to Natick. According to the narrative comments, for non-Natick commodities, the demonstration is not required in many cases (for ammunition for instance). It appears to be a commodity specific requirement at the ACAT IV level, dictated by the directions from AMSAA.

Technique 25 (Utilize a single contract for EMD and First Production) was unique to Natick. As cited previously, the non-Natick respondents expressed concern with selection of a production contractor based on cost estimates generated in Dem/Val and they considered it in the Government's best interest to have competition in the first production. The reasons for the difference may be due to commodity differences relating to item complexity and contractor past performance, and/or differences in organizations' affinity for risk.

Non-Natick Unique Techniques - Technique 5 (Conduct concurrent Dem/Val DT and OT) was unique to the non-Natick respondents. This is interesting since Technique 4 (Combine Dem/Val DT and OT) was also one of their highest usage techniques and these two techniques are mutually exclusive. A number of non-Natick respondents commented on both techniques with the same statements. This implies that they either

did not recognize the difference or they would consider both and select the best one for the situation at hand. In addition those respondents who stated that Technique 4 was too risky agreed with Technique 5. One who disagreed with the use of Technique 4 stated regarding Technique 5 that he would "Definitely support this, DT and OT (are) not necessarily dependent on each other. Concurrent testing will bring you to completion quicker, shorten project schedule and labor dollars". However, Natick respondents clearly preferred Technique 4 over Technique 5. They indicated a preference for combined testing over concurrent testing in Dem/Val. Non-Natick respondents cited risk most often as the factor in their decision to select concurrency. Natick managers appear to be more willing to accept greater risk in the area of test phasing. This difference in philosophy may be due to commodity differences or past experiences on the part of either group.

Technique 7 (Conduct concurrent EMD DT and OT) was unique to non-Natick respondents and this mirrors the results regarding Technique 5 above. Natick respondents preferred combined testing (Techniques 4 and 6) and non-Natick respondents preferred concurrent testing (Techniques 5 and 7). Both groups supported acceleration of testing in both Dem/Val and EMD. But differences in opinion concerning acceptable risk levels leads to a clear difference of opinion on how to accomplish this acceleration.

Technique 17 (Waive requirement for a separate STAR) was unique to the eleven highest usage techniques of the non-Natick group. However, the Natick usage level was also very high, although not in their top ten. In addition, it is clear from the narrative comments that there is general agreement that the technique is supported and that a STAR for ACAT IV programs is generally not necessary and not required of the managers.

Technique 26 (Conduct production First Article Tests to validate development deficiency corrections) was unique to the eleven techniques used most often by the non-Natick group. However, the Natick usage level was also very high, although not in their top ten. In addition, it is clear from the narrative comments that there is general agreement that the technique is supported. Validating development deficiency corrections

has become one of the purposes of First Article Testing (FAT) . It makes good business sense to validate the corrections in First Article instead of conducting a separate validation test prior to a Milestone Decision and FAT. Combining of testing needs is being applied here and as noted earlier with respect to DT and OT in Dem/Val and EMD.

Technique 27 (Validate technical manuals/support system during first production instead of during EMD) was unique to non-Natick respondents. The non-Natick respondents indicated in their narrative comments that this would be a better test of the support system and it avoids unnecessary changes to the manuals/support system due to configuration changes in EMD. This technique was not used by Natick, as respondents indicated that waiting until production was too risky, and that the manuals and support system were required for evaluation during IOT&E. This may be a result of past attempts by Natick managers to institute this technique that were not supported by other acquisition team members. Commodity differences may have allowed other Commands to get acquisition team approval for this technique when Natick had not been able to.

Summary - In summary, the high usage streamlining techniques used by ACAT IV managers that are common to Natick and the other AMC Commands can be categorized into two groups, major program events and programmatic reporting/documentation.

The common major event techniques address combining, or concurrency of events. Managers combine Milestones 0 and I, or I and II; they conduct combined (Natick) or conduct concurrent (non-Natick) Dem/Val and EMD DT and OT; they use a single contractor for Dem/Val and EMD; and they utilize FAT to validate development deficiency corrections. The techniques are chosen because they save large amounts of time and funding, and they have an acceptable level of risk for ACAT IV programs. The common programmatic reporting/documentation techniques are the acceleration of independent evaluator/assessor reporting for Milestone Decision Reviews, and the waiving of the need for a STAR, or COEA for their programs.

The high usage techniques that were unique to either the Natick or non-Natick group appear to be due to risk acceptability differences that may be due to commodity differences or past experiences. It was noted that Natick managers were consistently greater risk-takers regarding test phase streamlining.

B. TECHNIQUE-BY-TECHNIQUE COST SAVINGS AND SCHEDULE REDUCTION COMPARISONS

To evaluate the measures of effectiveness associated with the cost and schedule savings, this section will begin with an overall comparison of the cost savings of small and large programs. Then the techniques with the highest savings will be evaluated and compared with the techniques established in the last section as having the highest usage. Comparisons will then be made between small and large programs regarding the differences in high saving techniques. Finally, the techniques with the lowest savings will be evaluated, as opposed to the techniques with the highest usage, and then by comparing small versus large programs. As noted earlier, the lowest saving techniques are being evaluated because a number of them were both low in savings and high in use, which has an interesting basis.

1. Overall Comparison

Before evaluating the highest and lowest saving techniques, a review of all techniques by program sizes revealed an interesting relationship. The relative technique-to-technique average cost savings established by the respondents from small and large programs, Figure 5, is very consistent. Cost savings for small programs are equal to, or slightly lower than, large programs for almost every technique. A similar comparison of the schedule reduction ratings for small versus large programs showed no clear trend. Note that the numbers of observations for schedule reduction in the small program category were small, with a number of cells containing very few or no responses (see Table 2).

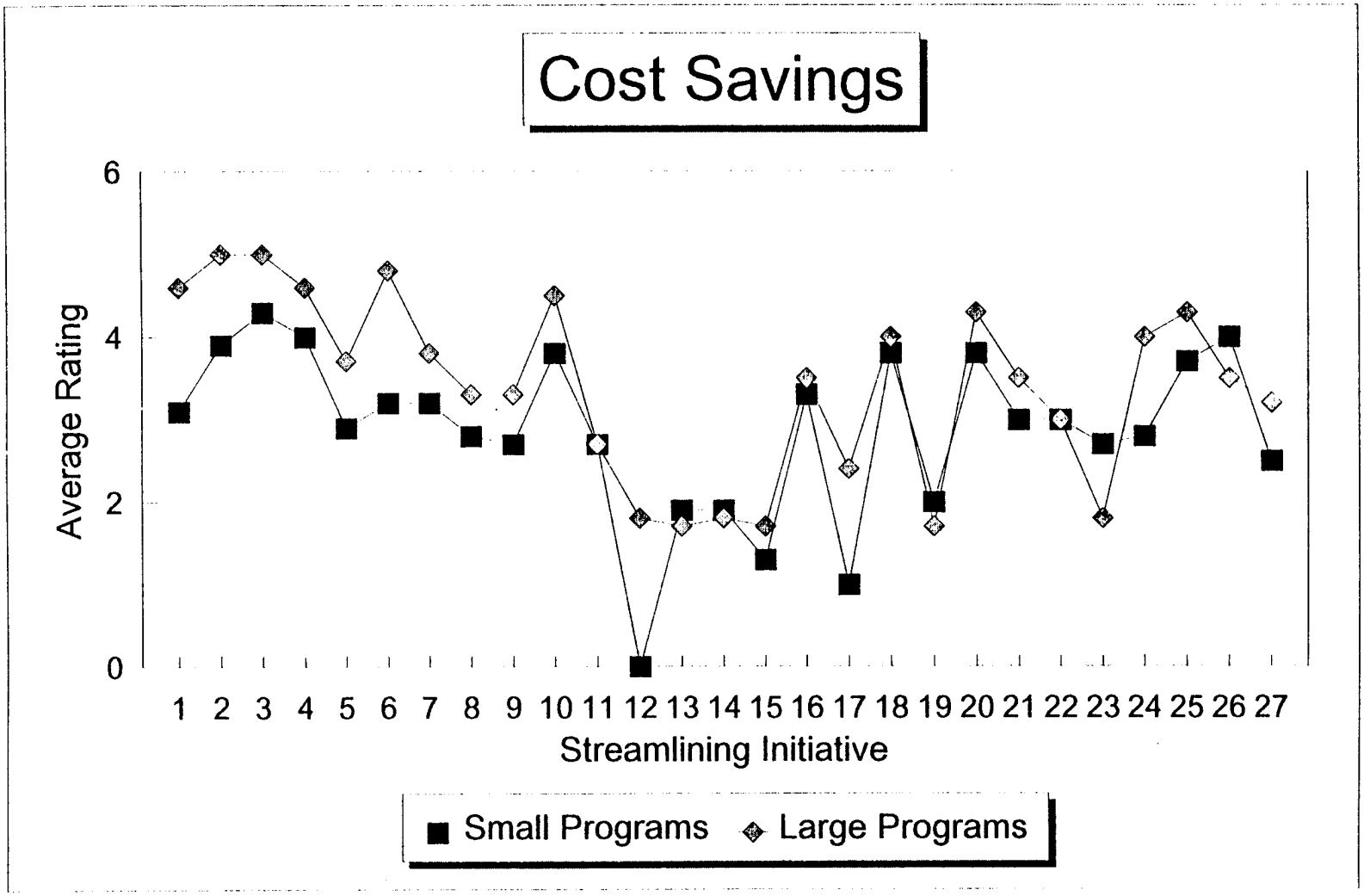

Figure 5. Small vs. Large Program Cost Savings

The cost saving comparison indicates a general agreement between small and large program managers as to the relative cost saving potential of each technique. There was general agreement on which techniques saved the most and which saved the least. The four techniques with the largest separations between small and large programs will be analyzed individually for reasons for the large differences.

Technique 6 (Combine EMD DT and IOT&E) saved significantly more for large programs. The reason is not apparent from the narrative comments of the respondents. However, it may be due to the increased complexity of larger systems and the associated greater test costs.

For Technique 12 (Request DA-Directed Procurement), the small program response rate (and associated projected cost savings) was zero. Since use of this technique is urgency driven (and then only as a last resort), small programs may never have the level of urgency or importance to warrant its use. This is supported by comments from small program managers that included not seeing any occasion for using the technique.

Technique 17 (Waive requirement for a separate STAR) was consistently indicated by small program managers, as well as many large program managers, as not being required. Therefore, the benefit to them was small. A few large program managers indicated savings and some of their programs may be threat driven and warrant significant effort with respect to threat assessment. One large program manager noted he supported the waiver concept "if the system will be in a limited or no combat environment".

Technique 24 (Utilize a single contract for Dem/Val and EMD) had significantly higher cost savings for large programs. Although the narrative comments did not provide a reason for the difference, it may indicate that contract preparation, evaluation, and execution cost savings for larger programs are greater due to increased system complexity. As the complexity of a system increases the development costs increase, and higher cost development contracts involve increased regulatory requirements and more rigorous proposal evaluation procedures, both of which increase administrative costs. In

addition, consolidation of two complex contract requirements can save substantially by eliminating the second contractor's start-up costs. Also, a contractor for the combined effort can propose a lower cost program when a longer duration effort is guaranteed. These points indicate that as a program size increases, the potential savings from consolidation of Dem/Val and EMD contracts increases as well.

Overall, there is general agreement between small and large programs regarding the relative cost saving potential of each of the streamlining techniques. Two areas where large programs deviate from the trend are combining EMD DT and IOT&E, and using a single contract for Dem/Val and EMD, both of which may be due to the increased complexity of larger programs. Additionally, large programs have a greater need for, and larger cost savings from, threat and urgency related techniques.

2. Highest Saving Techniques

The techniques with the highest cost savings and schedule reduction are highlighted in Table 6. The top six techniques in each category were selected for evaluation. By comparing the techniques with the highest savings to those with the highest usage, as well as the differences between small and large programs, Figure 6, a number of interesting similarities and differences can be noted. A comparative analysis of the techniques with high savings in at least two categories and those with the highest usage yields five techniques in both categories and three that have high savings but were not highly utilized. The following discussion first considers techniques with both high savings and high usage, then it addresses those with high savings and low usage, and finally it examines the differences between small and large programs.

High Savings and High Usage - Techniques 1 (Combine Milestones 0 and I), 2 (Combine Milestones I and II), and 4 (Combine Dem/Val DT and OT), from the above high usage discussion were noted by the respondents as having been selected because they save large amounts of time and funding. Specific comments were:

Projected Savings by Program Size

Highlighting Highest Savings — Shading = Highest Usage and Ratings

	Cost Savings *				Schedule Reduction **			
	Small Programs ($0-$7MIL RDTE)		Large Programs (>$7MIL RDTE)		Small Programs ($0-$7MIL RDTE)		Large Programs (>$7MIL RDTE)	
No. of Respondents	10		9		5		14	
Streamlining Technique	No. of Observations	Avg Rating	No. of Observations	Avg Rating	No. of Observations	Avg Rating	No. of Observations	Avg Rating
1	7	3.1	9	4.8	4	3.5	12	3.9
2	7	3.9	9	5	3	3.3	12	4.3
3	1	4.3	4	5	1	3.0	7	4.6
4	5	3.4	7	4.6	3	3.3	11	3.4
5	7	2.9	6	3.7	3	3	9	3.1
6	5	3.2	6	3.8	3	3.3	8	3.6
7	5	3.2	6	3.8	3	3.3	8	3.4
8	4	2.8	6	3.3	1	4	8	2.9
9	3	2.7	4	3.3	0	0	8	3
10	1	3.0	6	4.5	1	2	8	3
11	3	2.7	6	2.7	3	3.3	7	2.9
12	0	0	4	1.8	1	2	3	3
13	7	1.9	6	1.7	3	2.3	12	2.5
14	7	1.9	8	1.8	4	2.3	12	2.8
15	4	1.3	6	1.7	2	2	9	2.4
16	3	3.3	6	3.5	2	2	7	3.1
17	1	1	7	2.4	3	2.7	5	3.2
18	3	4.0	5	4	2	3.5	8	3
19	2	2	3	1.7	2	1.5	3	2.7
20	1	3.0	3	4.3	2	3	5	3.2
21	3	3	2	3.5	1	3	4	2.8
22	1	3	2	3	1	3	2	2.5
23	3	2.7	5	1.8	1	3	8	3.4
24	6	2.8	4	4	1	3	10	4.1
25	3	3.7	6	4.3	1	3	6	4.2
26	1	1	6	3.5	2	3.5	6	3.5
27	2	2.5	5	3.2	0	0	7	2.5

Notes:	Rating	1	2	3	4	5
*	Cost Savings	$0-$100	$100-$1K	$1K-$10K	$10K-$100K	>$100K
**	Schedule Reduction	0-7 days	1-4 weeks	1-6 months	6-18 months	>18 months

Table 6. Techniques with the Highest Savings, Shading = Highest Usage and Highest Ratings

Projected Savings by Program Size

Techniques with Highest Savings

Streamlining Technique	Cost Savings		Schedule Reduction	
Shading = Techniques with Highest Usage	**Small Programs**	**Large Programs**	**Small Programs**	**Large Programs**
1. Combine Milestones 0 and I (Skip Concept Exploration (CE) Phase)		X	X	X
2. Combine Milestones I and II (Skip Demonstration/Validation (Dem/Val) Phase)	X	X	X	X
3. Combine Milestones I and III (Skip Dem/Val and Engineering & Manufacturing Development (EMD) Phases)	X	X	X	X
4. Combine Dem/Val Development Test (DT) and Operational Test (OT)	X	X		
6. Combine EMD DT and Initial Operational Test & Evaluation (IOT&E)		X	X	X
10. Conduct user evaluation in lieu of formal IOT&E in EMD Phase	X	X		
18. Waive requirement for a separate Logistics Demonstration	X		X	
20. Conduct abbreviated Logistics Support Analysis and Reporting (LSA/LSAR)	X			
24. Utilize a single contract for Dem/Val and EMD				X
25. Utilize a single contract for EMD and First Production				X
26. Conduct production First Article Tests to validate development deficiency corrections	X		X	X

Figure 6. Projected Savings by Program Size, Techniques with the Highest Savings.

Technique 1 - The total manpower costs and schedule associated with doing a Milestone 0 will be somewhat costly, today we are told that we need to deliver products in a few years, doing an additional step doesn't streamline the process.
Technique 2 - Shortens time and reduces number of documents.
Technique 4 - Cost of testing is very expensive, schedule can be greatly shortened, in some situations the acquisition cycle can be cut in half.

The managers agree that, for low risk programs, skipping phases and combining tests makes sense. For Technique 1 there is a lack of a need for the event and for the other two techniques the increase in risk is not unreasonable for low complexity, technologically mature programs.

Technique 18 (Waive requirement for a separate Logistics Demonstration), a high Natick usage technique, also had a high payoff for small programs in terms of both cost and schedule savings. The need for a logistics demonstration was stated by one respondent as "depending on the complexity of the system". Therefore, smaller programs would have less of a need for a separate event, and imposing a separate event would have a greater impact on their programs in terms of percentage of the total cost and schedule.

Technique 26 (Conduct production First Article Tests to validate development deficiencies), as stated in the above high usage analysis, follows the overall philosophy of combining events, especially tests, because combining saves the most in terms of program funding and schedule. Managers are fulfilling the need to validate the corrections without having to run a separate event. It makes good business sense and is accepted as "business-as-usual" by ACAT IV managers.

Although the numbers are not statistically significant, for the above high savings and high usage techniques the ranges of cost and schedule savings noted by the respondents were as follows:

Small Programs	Cost Savings	Schedule Reduction
Technique 1.	N/A	1 - 18 MOS.
Technique 2.	$0 - >$100K	1 - 18 MOS.
Technique 4.	$100 - >$100K	N/A
Technique 18.	$0 - >$100K	1 - 18 MOS.
Technique 26.	$10K - $100K	1 - 18 MOS.
Large Programs		
Technique 1.	$10K - >$100K	1 - >18 MOS.
Technique 2.	>$100K	1 - >18 MOS.
Technique 4.	$10K - >$100K	N/A
Technique 26.	N/A	1 - >18 MOS.

These ranges of savings are generally too broad to be of value to ACAT IV managers in their streamlining decision-making. However, the large program cost savings ranges for Techniques 1 and 2 are of value. The quantity of respondents answering each was nine and their responses were very consistent.

High Savings without High Usage - Technique 3 (Combine Milestones I and III) presents the potential for the greatest savings since it eliminates most of the development process. But its applicability is limited to NDI and modified NDI programs because the technique allows for very little test and evaluation. As stated by one respondent "Not applicable to all systems, combining of the two for an NDI makes sense".

Technique 6 (Combine EMD DT and IOT&E) presents the potential for savings of the same order as Technique 4, which had high savings and high usage. But the respondents felt that a combined test in EMD was much more difficult and risky than one in Dem/Val. Comments included "Risk of failure is high unless prior effort was very successful", "Often difficult to get OEC and TEXCOM to agree", and "Too hard to schedule user troops".

Technique 10 (Conduct user evaluation in lieu of formal IOT&E) was noted as a large saver of funding but not time. Comments were that IOT&E was expensive, but that the evaluators and assessors would not accept the results of an informal user evaluation in lieu of IOT&E. The technique could save significant funding but the lack of tester control and data collection capabilities make the informal evaluation unacceptable in most cases.

In summary, the high use of the combining of milestones and testing phases by ACAT IV managers is supported by the high savings in program costs and time that is associated with these streamlining techniques. For small programs the Logistics Demonstration is less useful and elimination represents a significant percentage of the program's cost and schedule. Other techniques that could save significant amounts of funding and time are unique to special cases such as NDI programs or are impractical and/or risky.

Small versus Large Programs Comparison - With respect to cost savings, four techniques are common to small and large programs. Techniques 2 and 3, which combine Milestones I and II, and I and III, respectively, were high cost savers for both size programs. This is understandable given the comments previously noted, that these techniques save significant amounts of time. Technique 1 (Combining of Milestones 0 and I) was only considered a significant cost saver for large programs. For small programs the concept exploration phase did not involve significant funding. For low technology systems that require no concept testing, but only require a concept prove-out paper study, this result can be expected.

In addition, Technique 4 (Combining of Dem/Val DT and OT) was common to both groups. This was noted previously as a very high saver. Finally, Technique 10 (Conduct user evaluation in lieu of IOT&E) was common to both size programs. The respondents comments noted that formal OT, especially IOT&E, was very expensive.

High cost saving techniques that were unique to either small or large programs were Techniques 6, 18, and 26. Technique 6 (Combining of EMD DT and IOT&E) was unique to large programs and the reason was not discernable from the respondent's

comments. The difference may be complexity related, where the cost of IOT&E increases substantially as program complexity increases. Technique 18 (Waive requirement for a separate Logistics Demonstration) was unique to small programs. As discussed previously, this technique saves a significant percentage of a small program's funding and time, where low complexity warrants its use. Technique 26 (Conduct production FAT to validate development deficiency corrections) was unique to small programs but only two respondents contributed to the high score.

Overall, the same techniques, the combining of Milestones and test phases, save the most funding for both small and large programs. The one exception was that the combining of Milestones 0 and I for small programs did not save significant dollars, possibly because the proof of concept for low technology/complexity systems requires little, if any, breadboard testing and usually only requires a paper study.

With respect to schedule reduction, the results were very similar to the cost saving results. The combining of Milestones (0/I, I/II, and I/III) were all high schedule savers for both small and large programs. The combining of any Milestones, even Milestones 0 and I for small programs, saved significant amounts of program time. The combining of EMD DT and IOT&E, Technique 6, was also a common high schedule reducer. But the combining of Dem/Val DT and OT, Technique 5, was not, even though it was a high cost saver for both groups. As was noted in the previous section, the complexity of testing in EMD and the length of formal IOT&E may contribute to the difference.

Additionally, Technique 26, using FAT to validate development deficiency corrections, was common to both groups. By utilizing the planned FAT to validate the deficiency corrections, the program can avoid a separate event and can proceed out of development, both significant schedule impacts.

The one technique that was unique to small programs was Technique 18 (Waive requirement for a separate Logistics Demonstration). See the previous discussions concerning analysis of this point.

Highest Saving Techniques Summary - Overall, the greatest time and funding savings can be obtained by combining Milestones and test phases. Concurrency of testing was not one of the highest savers, even though it was noted as a high usage technique, particularly for Commands other than Natick. Small and large programs are very similar with respect to the highest saving techniques, with a few exceptions. For large programs the expected range of cost savings associated with Techniques 1 (Combine Milestones 0 and I) and 2 (Combine Milestones I and II) are greater than $10K and greater than $100K, respectively.

3. Lowest Saving Techniques

The techniques with the lowest cost savings and schedule reductions are highlighted in Table 7. As discussed previously, the lowest saving techniques are being evaluated because a number of them were both low in savings and high in use. The lowest six techniques in each category were selected for evaluation. The amounts of funding saved are too small to be of concern in the decision-making process. However, the amount of time saved might be of concern, if the program were in a time critical phase (such as leading up to a Milestone Review or contract award). By comparing the techniques with the lowest savings to those with the highest usage, and the differences between small and large programs, Figure 7, a number of interesting similarities and differences are noted.

Low Savings and High Usage - A comparative analysis of the techniques with the lowest savings in at least two categories and those with the highest usage yields five techniques in both categories and three that have low savings and that were not highly utilized.

Techniques 13 and 14 are the two high usage techniques concerned with the acceleration of Independent Evaluation/Assessments for Milestone Decision Reviews. As discussed earlier, the reason for the high usage was due to the timing of the Milestone Decision Review. The time-line for a Review is very tight and slippage is usually considered unacceptable, especially if follow-on contract award (and obligation of unprotected funds) is awaiting the decision. With events measured in days and weeks it

Projected Savings by Program Size

Highlighting Lowest Savings — Shading = Highest Usage and Lowest Ratings

	Cost Savings *				Schedule Reduction **			
	Small Programs ($0-$7MIL RDTE)		Large Programs (>$7MIL RDTE)		Small Programs ($0-$7MIL RDTE)		Large Programs (>$7MIL RDTE)	
No. of Respondents	10		9		5		14	
Streamlining Technique	No. of Observations	Avg Rating	No. of Observations	Avg Rating	No. of Observations	Avg Rating	No. of Observations	Avg Rating
1	7	3.1	9	4.6	4	3.5	12	3.9
2	7	3.9	9	5	4	3.8	12	4.3
3	7	4.3	4	5	4	3.8	7	4.6
4	9	4	5	4.6	3	3.3	11	3.4
5	7	2.9	6	3.7	3	3	9	3.1
6	5	3.2	5	4.6	1	4	6	3.8
7	5	3.2	6	3.8	3	3.3	8	3.4
8	4	2.8	6	3.3	1	4	8	2.9
9	3	2.7	4	3.3	0	0	6	3
10	4	3.6	6	4.5	1	2	8	3
11	3	2.7	6	2.7	3	3.3	7	2.9
12	0	0	1	1.9	3	2	3	3
13	7	1.9	6	1.7	3	2.3	12	2.9
14	7	1.9	6	1.9	4	2.3	12	2.9
15	4	1.9	6	1.7	2	2	8	2.4
16	3	3.3	6	3.5	2	2	7	3.1
17	1	1	7	2.4	3	2.7	5	3.2
18	5	3.8	5	4	2	3.5	8	3
19	2	2	3	1.7	1	1	3	2.7
20	4	3.8	3	4.3	2	3	5	3.2
21	3	3	2	3.5	1	3	4	2.8
22	1	3	5	1.8	1	3	2	2.5
23	3	2.7	3	1.7	1	3	8	3.4
24	8	2.8	4	4	1	3	10	4.1
25	3	3.7	6	4.3	1	3	9	4.2
26	2	4	6	3.5	2	3.5	6	3.5
27	2	2.5	5	3.2	0	0	7	2.6

Notes:	Rating	1	2	3	4	5
*	Cost Savings	$0-$100	$100-$1K	$1K-$10K	$10K-$100K	>$100K
**	Schedule Reduction	0-7 days	1-4 weeks	1-6 months	6-18 months	>18 months

Table 7. Techniques with the Lowest Savings, Shading = Highest Usage and Lowest Ratings

Projected Savings by Program Size - Techniques with Lowest Savings

Streamlining Technique	Cost Savings		Schedule Reduction	
Shading = Techniques with Highest Usage	**Small Programs**	**Large Programs**	**Small Programs**	**Large Programs**
10. Conduct user evaluation in lieu of formal IOT&E in EMD Phase			X	
12. Request DA-Directed Procurement prior to Type Classification-Standard	X	X	X	
13. Staff Milestone Decision Package prior to receipt of Independent Evaluation/Assessment Reports (IER/IAR), with reports expected prior to the decision meeting	X	X		X
14. Use Interim Assessment or Evaluation Reports to support a Milestone Decision, with decision contingent upon favorable Final Reports	X	X		X
15. Use Independent Evaluator Briefing in lieu of written reports to support a Milestone Decision, with written report(s) to follow	X	X	X	X
16. Waive requirement for a Cost and Operational Effectiveness Analysis (COEA)			X	
17. Waive requirement for a separate System Threat Assessment Report (STAR)	X			
19. Utilize Test Integration Working Group (TIWG) as Electromagnetic Environmental Effects (E3) Requirements Board	X	X	X	X
22. Don't generate Independent Life Cycle Cost Estimate				X
27. Validate technical manuals/support system during first production instead of during EMD			X	X

Figure 7. Projected Savings by Program Size, Techniques with the Lowest Savings

is understandable why the small savings associated with the use of these techniques warrants their broad use. The high use may indicate that these techniques become necessary due to slippages leading up to the Review, or delays by the evaluators/assessors. But the respondent comments indicate that they are utilized because they make sense, they save time at a critical point in the process and there is little risk with their implementation.

Technique 27 (Validate technical manuals/support system during first production instead of during EMD) also saved little, in terms of schedule, but it was highly utilized by Commands other than Natick. The cost savings associated with this technique were not high, eliminating cost as the reason for the high usage. The non-Natick respondents indicated that this technique was a better test of the support system, whereas Natick respondents saw it as risky, or unrealistic (has to be done prior to IOT&E). The non-Natick respondents appear to favor the technique not because of cost or schedule savings considerations, but because it provides a higher quality product, a factor outside of the considerations of the survey.

Techniques 16 (Waive COEA) and 17 (Waive STAR) were also highly utilized with low savings. As noted earlier, these techniques appear to be a standard way of doing business for most ACAT IV programs. The documents are generally not required and they should be considered for generation on a "by exception" basis only.

Low Savings without High Usage - Techniques that had low savings and were not highly utilized indicate the difficulty in their utilization and their lack of usefulness. Technique 12 (Request DA-Directed procurement prior to Type Classification-Standard), as discussed earlier is difficult to get approved and is inappropriate except for in extreme emergencies. Technique 15 (Use Independent Evaluator Briefing in lieu of written reports to support a Milestone Decision) is shown to be a less desirable option to Techniques 13 and 14, and it accomplishes the same thing (accelerate the evaluation process). Respondents preferred some form of written report in advance of the Decision Review. Technique 19 (Utilize TIWG as E3 Requirements Board) doesn't appear to save program time or funding. It merely saves the need for two staffing and coordination groups.

Small versus Large Programs Comparison - With respect to cost savings, all of the lowest saving techniques are common to both small and large programs. As noted earlier, the amounts of funding saved are relatively meaningless and the narrative comments contain no basis for this agreement.

With respect to schedule reduction, Techniques 15 and 19 are common to small and large programs, and as noted earlier they are not highly utilized. They uniformly provide little savings for the reasons noted above. Technique 27 is also common to both groups and, as noted earlier, is utilized by non-Natick respondents to provide a better product. Techniques 13 and 14 are unique to large programs with respect to their low schedule savings. The ratings for small programs are also fairly low, with averages that are actually lower than the large program amounts. Note, also, that the small program number of observations are very low in some cases.

Lowest Saving Techniques Summary - In general, small schedule reductions are important when they occur close to key events, such as the Milestone Review. Waivers of documentation, such as the COEA and STAR, do not create significant savings, but they are generally not applicable to, nor required of, ACAT IV programs. Some techniques, such as validation of the support system in production, are valuable to some respondents because of improved quality, not savings of time or funding. Some techniques are of little to no value because they either do not save enough to matter, or because better alternative streamlining methods exist. There are no important differences in savings between small and large programs that are discernable from the data.

C. COMMANDS' ACAT IV MANAGEMENT COMPARISON

As noted earlier when excluding MICOM and CECOM from the analysis, the management of ACAT IV level programs in their commodity areas differs from that in the areas supported by the other AMC Commands. This difference will be investigated by first describing the differences between the two management structures, then exploring the reasons for the differences, and finally evaluating the pros and cons of each. The

Appendix A. POCs' comments and the researcher's personal experience as a manager at Natick form the basis for these comparisons.

The management of small development programs within the U.S. Army generally travels along the following path: (1) the AMC RDECs and Army Research Laboratory (ARL) investigate technologies and consider concepts for development (Technology Base and Concept Exploration Phases); (2) for the development phases, some programs transition to the Program Executive Officer (PEO) management structure, others remain with AMC and are managed by AMC level PMs, and still others are left with the AMC RDECs; (3) following development and fielding, management transitions to the AMC MSCs for sustainment and eventual disposal. In the cases of CECOM and MICOM, none of the programs remain in AMC when they transition into development, they all transition to PEO management.

Both of these management philosophies appear to be allowed by DoD 5000, but the method employed for the CECOM and MICOM commodities does not appear to meet the intent of DoD 5000 or its basis, the Packard Commission Findings, both of which were discussed in Chapter II. The required Milestone Decision Authority levels for each of the ACATs in DoD 5000 are listed in Figure 2. In addition, the program management levels associated with each ACAT level are defined in the Army's implementation regulation for DoD 5000 (AR 70-1) and the criteria for their selection are listed below:

ACATs	Program Management	Primary Criteria
I	PEO PM	$300M RDTE, $1.8B Procurement
II	PEO PM	$115M RDTE, $540M Procurement
III	PEO or AMC PM	High Visibility, Special Interest
IV	Systems Manager	All Other Acquisition Programs

From these criteria, it can be established that only the more important lower cost programs should require certified PMs. In addition, the mission of the PEO is stated as the cost-effective acquisition of **major** new weapon/support systems. Whereas, the

related AMC missions are the acquisition of non-PEO new weapon/support systems and the improvement and sustainment of mature, fielded systems. Although there does not appear to be a restriction against PEO management of all development programs in a commodity area, from the above statements the intent of the DoD and the Army appears to be that non-certified AMC managers should manage the development of the smaller new systems in each of the commodity areas.

There may be some commodity related explanations for this difference. Programs remain with Natick and ERDEC because there are no PEOs controlling their commodities. TARDEC encompasses ARDEC munitions and support items that have carried over from the disestablished Belvoir RDEC that do not have related PEOs. In addition, AATD manages a number of aviation support items that are not controlled by the PEO Aviation. In the cases of CECOM and MICOM, the AMC Commands and the PEOs are directly aligned, with respect to commodities, and they are co-located. Of the above three Commands, the only one with a situation similar to CECOM and MICOM is AATD. This alignment and the PEOs' degree of control over funding decisions may have led to a clear distinction between the missions of the two, with an evolution to PEO control of all development.

The disadvantage of the MICOM/CECOM model, according to the MICOM POC, is that the PEOs have assumed control of all development and upgrade responsibilities, and AMC has become completely focused on supporting the PEO, relinquishing their mission to improve mature, fielded systems. The concern of MICOM is that the PEOs do not fully consider system upgrades when evaluating the need for a new or improved capability. They concentrate on developing new systems.

The above concerns could be labeled as an AMC Command complaining about the PEOs and their own loss of control over programs and funding. With the establishment of the PEO structure in the late 1980s, the AMC Commands such as CECOM and MICOM lost a great deal of funds control and power. In addition, much of AMCs technical efforts transitioned to a role directly support the PEOs, and the PEOs control of funding gives them control over AMCs staff. Both of these factors have

sometimes lead to a power struggles and attempts at "mission-poaching". However, the fact that the PEOs control **all** developments indicates a degree of over-management that was not intended by the Packard Commission nor expressed in DoD 5000, where ACAT III and IV programs do not require PEO management. The Packard Commission findings created the framework for the Acquisition Executive and PEO structure and they were specifically directed at major weapon systems.[Ref. 25] DoD 5000 allows for ACAT III and IV management at the lowest level deemed appropriate by the Acquisition Executive (see Figure 2). There is clearly a place for management of ACAT IV size programs by individuals who are not certified PMs, as noted by the ACAT structure in DoD 5000 and the allowance for AMC management of ACAT III and IV programs. In fact, this management structure is in place at the other AMC Commands that participated in this study.

On the other hand, AMC management of existing programs and funding lines suffers from a lack of visibility and power when competing with the PEOs. The PEOs, if they fully considered upgrades when evaluating a new requirement, and if they managed small programs without creating new certified PMs, would be more efficient as the single point of contact for all developments in a given commodity area. In addition, even the smallest programs would benefit from the green-suit management available within the PEOs.

D. OTHER COMMENTS

Two streamlining techniques that were proposed by the respondents to the survey are worth mentioning, at least for future reference or use in follow-on studies,

1. Use of capstone Program Management Documentation such as TEMPs, ORDs. Allows development of several related efforts without waiting for separate staffing and creation of multiple documents.

2. Use of multi-year production contracting can result in long-term cost and time savings.

The first of these techniques recommends that organizations, rather than individual ACAT IV managers, develop and maintain documentation that is required for the development of new systems within their commodity areas. All systems requiring development in a commodity area such as heavy cargo and resupply airdrop or a family of field heaters, for instance, could be supported with commodity level requirements documents (Acquisition Strategies, Test and Evaluation Master Plans, etc). For low complexity systems (ACAT IV), over-arching documents may unburden individual managers and, overall, save funding. Coordination of changes to the documents as the various efforts evolve, however, could be a burden and the process could create its own bureaucracy. But the concept is certainly worth considering for some systems and commodities.

The second technique addresses the production phase of materiel acquisition which this study considered only when a streamlining technique involved a transition from development into production. If the goal of development, and the acquisition process in general, is fielding of new and improved systems, production is as important as development. When considering methods for cutting the cost and time required to field new systems, production should be considered if the entire process is to be improved. However, for many small systems, the management of the program transitions from the RDEC to a procuring command prior to these decision. Analysis of both phases together would require investigating two distinctly different set of issues with two completely different groups. Therefore, it is suggested that both groups be investigated, but in separate, parallel efforts.

VI. CONCLUSIONS AND RECOMMENDATIONS

The Primary Research Question for the study was: "What acquisition streamlining techniques are utilized by U.S. Army ACAT IV managers?" By conducting a survey of all of the Army's ACAT IV development managers, from all of the Commands doing ACAT IV level development, this thesis sought to ascertain the differences among Commands and determine which techniques are most prevalent, most useful, and the circumstances that cause them to be successful.

In support of this thesis, 39 questionnaires were distributed to the ACAT IV development managers at various U.S. Army AMC Commands. Two Commands, CECOM and MICOM, were eliminated from the survey as is was determined that all of their development programs were at the ACAT III level or higher. A total of 19 responses were obtained, with some Commands providing limited responses. Given this response level, a limitation was created as it was difficult to establish statistical significance for the results, since the quantity of observations was lower than expected. However, the data that was received was deemed to be valid. Therefore, the analysis was conducted on a qualitative, rather than predominately quantitative, basis. Following are the conclusions and recommendations drawn from this analysis, as well as recommendations for further research in the subject area of acquisition streamlining of small DoD development programs.

A. CONCLUSIONS

Subsidiary Research Question 1. - How do Army Commands streamline ACAT IV programs differently? The purpose of this segment of the study was to determine if all U.S. Army Commands were aware of all available streamlining techniques and establish if there were differences in the Commands usage levels or patterns.

The first area to be analyzed was Command awareness of the techniques. The investigation found that of the 25 techniques used among the five Commands, there was

only one instance where none of the respondents from a particular Command where aware of a specific technique. Based on this, it can be concluded that cross-fertilization of the identified streamlining concepts exists among the U.S. Army Commands. The information is available to all of them.

The second area of analysis was a comparison of the techniques with the greatest differences in usage levels among the Commands. The relative usage levels for the various techniques is consistent among all Commands. For those techniques where the usage differed the most, the reasons were disagreement with the value or risk of the technique, or commodity/Command differences. The specific techniques with the greatest differences were:

1. Combine Dem/Val DT and OT
2. Utilize a single contract for EMD and First Production
3. Waive requirement for a separate Logistics Demonstration
4. Validate technical manuals/support system during first production instead of during EMD.
5. Request MDA delegate Milestone Decision Review Chairmanship to RDEC management

The first two techniques were utilized more often by Natick managers because the managers considered their level of risk acceptable. For the third technique, managers in the Natick commodities areas were more likely to have this requirement imposed upon them. Therefore, the need for them to consider a waiver was necessary more often. The fourth technique was more likely to be used by managers at Commands other than Natick. The managers at these other Commands saw this technique as providing a higher quality product. However, difficulties in getting acquisition team consensus and the timing of events made it less attractive to Natick managers. The need for the fifth technique was based on Command structure differences, where the more remotely located managers favored having the Chairmanship delegated.

The final area of analysis for this sub-question addressed the techniques that were utilized most often by all of the Commands. A number of streamlining techniques are used routinely by most ACAT IV programs. For techniques affecting major program

phases and events, the risk levels associated with actions such as the combining of Milestones and the concurrency of test phases are considered acceptable for programs at this level of complexity. Although quantifiable ranges for the levels of savings expected for the techniques could not be concluded from the research (because of the low number of participants and respondents) the following can be concluded as the key techniques utilized by most ACAT IV managers.

1. Combining of Milestones 0 and I, and/or I and II
2. Combining of test phases, both in Dem/Val and EMD, for Natick managers
3. Concurrency of test phases, both in Dem/Val and EMD, for non-Natick managers
4. Combining development deficiency correction validation testing with First Article Testing
5. Utilize a single contract for Dem/Val and EMD

A difference was noted in the test program streamlining philosophies of managers from Natick and the other Commands. All Commands favored streamlining through concurrent or combined DT and OT/IOT&E. However, Natick managers favored combined testing, while managers from other Commands favored concurrent testing, in both Dem/Val and EMD. Combined testing entails greater program risk and Natick managers indicated a greater degree of risk acceptance.

Additionally, it was concluded that the following techniques that address program documents and lower-level actions were used by most ACAT IV managers:

1. Waive requirement for a COEA
2. Waive requirement for a separate STAR
3. Staff Milestone Decision Package prior to receipt of Independent Evaluation/Assessment Reports
4. Use Interim Assessment or Evaluation to support a Milestone Decision

It was concluded that ACAT IV programs generally do not require COEA or STAR program documents. The COEA is considered inaccurate, expensive and of little value. The STAR is generally unnecessary because most ACAT IV programs are not threat driven or combat related. They are typically combat support and combat service

support systems. Finally, independent evaluation and assessment reporting for Milestone Decision Reviews is commonly accelerated by staffing the Decision Review package prior to receipt of an evaluation/assessment or by utilizing an interim evaluation/assessment to support the Decision Review. Even though these techniques do not save much program time or funding, they represent low risk methods for acceleration of the process during the time-critical weeks prior to the Decision Reviews.

Subsidiary Research Questions 2 and 3 - How do the various streamlining techniques compare with respect to program cost savings? and How do the various streamlining techniques compare with respect to program schedule reduction? The purposes of these segments of the study were to consider cost and schedule savings to: (1) determine if small and large size program differences existed, and (2) investigate contributing factors to the techniques cited above as having high usage. An additional intended purpose, quantification of the expected cost and schedule savings for the streamlining techniques, was not possible because of the low number of participants and respondents.

The comparative analysis of differences between small and large size programs considered the cost savings differences for all techniques, as well as differences for the techniques with the highest and lowest cost and schedule reduction savings. Large programs were defined for purposes of the analysis as those requiring $7 million or more of RDTE funding (for the cost comparisons) and three years or more to complete development (for the schedule comparisons). The analysis concluded that cost savings for small ACAT IV programs are equal to, or slightly lower than, large programs for almost every technique. There is close agreement concerning the relative cost savings associated with each of the streamlining techniques in the study. The two major program areas where large programs deviated from the trend may be due to the increased complexity of larger programs. As program size and complexity increases, actions such as IOT&E and contracting can grow dramatically, with associated greater potential for savings through streamlining. The two techniques were:

1. Combining EMD DT and IOT&E
2. Using a single contract for Dem/Val and EMD

In addition, it was concluded that large programs had a greater potential cost savings for urgency and threat related techniques. This indicates that larger programs are more likely to be for combat-related items, closer to higher ACAT levels, and more likely to require threat assessments and urgency-related acceleration due to a combat deficiency or enhancement. The specific techniques were:

1. Request DA-Directed Procurement
2. Waive requirement for a separate STAR

The areas of analysis that compared the techniques with the highest usage and those with the highest and lowest savings supported the above conclusions for their high usage. The analysis contributing additional insights into the reasons for this high usage and the differences between small and large programs. The frequent use of the combining of milestones and the concurrency of testing phases by ACAT IV managers is supported by the high savings in program costs and time that is associated with these streamlining techniques. However, three techniques were noted as potentially saving a great deal, but they were not used often. They were:

1. Combine Milestones I and III
2. Combine EMD DT and IOT&E
3. Conduct user evaluation in lieu of formal IOT&E in EMD

The combining of Milestones I and III was concluded to be of limited application, to NDI or modified NDI programs only. The techniques of combining of DT and IOT&E and the use of a user evaluation in lieu of IOT&E were considered too risky and extremely difficult to implement, even for programs of the complexity of ACAT IVs.

The lowest saving techniques were evaluated because a number of them were both low in savings and high in use. The analysis of these techniques supports the reasons for their high use. It was concluded that techniques, such as the following, that save small

amounts of program time are important when their application supports key events, such as the Milestone Review:

1. Staff Milestone Decision Package prior to receipt of Independent Evaluation/Assessment Reports
2. Use Interim Assessment or Evaluation to support a Milestone Decision

In addition, waivers of documentation, such as the COEA and STAR, do not create significant savings, but they are generally not applicable to, nor required of, ACAT IV programs. Therefore, it is concluded that waivers of these requirements are easy to obtain.

Finally, it was concluded that some techniques, such as validation of the support system in production, are valuable because they provide a better product, not because of program funding or time savings. Some streamlining decisions are made based on quality considerations, a factor not considered in this study, where only cost and schedule were investigated.

Commands' ACAT IV Management Comparison - The final area of analysis in this study investigated the differences in the management of ACAT IV programs at the various AMC Commands. As noted earlier, the analysis of streamlining techniques portion of this study excluded programs managed by CECOM and MICOM, because all of their programs transitioned early in development to PEO management (and became ACAT III or higher). Although many programs at the other Commands transition to PEO management for development, there are some programs in all of the other Commands that remain within the management control of the AMC Commands, and some of these remain as ACAT IV (not requiring a certified PM). It was concluded that this difference in management control and responsibilities may be due to commodity differences. Commands such as Natick and ERDEC have whole commodity areas that have no related PEO, and all CECOM and MICOM commodity areas are directly linked to a PEO. The advent of the PEO system allowed for a complete transfer of control to the PEOs within

these Commands. This total control of the development programs in these commodity areas by the PEOs may be greater than was intended by the Packard Commission or DoD 5000. From the management level selection criteria in the Army's implementation regulation for DoD 5000 (AR 70-1) and the distinctions between the mission statements of AMC and the PEOs, it was concluded that the intent of DoD and the Army was that non-certified AMC managers manage the development of the smaller new systems in each of the commodity areas. However, PEO management does provide greater "Green-suit" input and this level of control could be more efficient if the PEOs did not create new organizations and certified PMs to manage these programs, and if they considered all avenues for meeting requirements, including the upgrade of fielded systems.

Summary - ACAT IV programs have, and can be further streamlined from the standard DoD 5000 process across programs and Commands in a number of ways. The following recommendations include changes that should reflect better results than the standard process, for programs at this level of complexity.

B. RECOMMENDATIONS

1. Recommendations Regarding ACAT IV Management

It is recommended that the results of this study be broadly distributed to ACAT IV managers. Even though the results provide no quantitative assistance for ACAT IV managers concerning expected savings levels for the various streamlining techniques investigated, the study does provide valuable information that should assist managers in their streamlining decision-making. One respondent commented, based on seeing only the survey form:

> You bring up lots of good ideas. I will keep a copy for use the next time I prepare an Acquisition Strategy.

ACAT IV managers can benefit from having the list of possible streamlining techniques, from knowing which streamlining techniques are used most often, and from

knowing the factors, such as program risk, that they must consider when developing a streamlining strategy.

ACAT IV programs dramatically streamline the "standard" DoD 5000 acquisition process. The process is not the standard for them, but for ACAT I programs and, as such, the managers of the ACAT IV programs begin their program planning process by proposing significant changes from the "standard". This streamlining process requires the concurrence of many acquisition management team members, some of whom have no incentive to support the increased risk associated with streamlining. This can result in program delays while agreements and compromises are reached and significant unnecessary program costs and time following portions of the "standard" process that are unnecessary from a risk reduction perspective. Therefore, it is recommended that the U.S. Army revise the baseline development process for ACAT IV programs, to one that incorporates the key streamlining techniques of Combined Milestones I and II and concurrent testing in EMD that were concluded in this study as common to most ACAT IV programs. A comparison of the major phases and events and their differences for the two "standards" is at Figure 8. It is recommended that these techniques be established as standard procedures from which requirements are either increased or decreased. In addition, it is recommended that the alternative process exclude the requirements for COEA and STAR, except on an "exception basis" only. In place of the current system, where the manager must begin with the full ACAT I/II process and struggle with the acquisition team members to cut out elements, this recommendation would put risk-averse acquisition team members in a position of justifying the need for adding requirements versus the manager having to justifying their exclusion.

Finally, it is recommended that the Army evaluate the ACAT IV management structure that is in place for CECOM and MICOM commodities. There is potential for over-management of the small programs in these commodity areas if they are all managed by certified PMs. There is a place for non-certified PM management (ACAT IV) in all commodities, as was intended by DoD 5000. The Army should consider

DoD 5000 Standard Acquisition Process

	Phase 0	Phase I	Phase II	Phase III	Phase IV
Tech Base & Demo Phase	Concept Explore. Phase	Dem/Val Phase	EMD Phase	Production & Deploy Phase	Ops & Spt Phase
Sequential Testing		| — DT— | | — OT— |	| — DT— | | — IOT&E— | | Retest |	| —FAT— |	

Milestone 0 Milestone I Milestone II Milestone III

Proposed ACAT IV Acquisition Process Alternative

	Phase 0	Phase II	Phase III	Phase IV
Tech Base & Demo Phase	Concept Explore. Phase	EMD Phase	Production & Deploy Phase	Ops & Spt Phase
Concurrent Testing		| — DT— | | — IOT&E— |	| —FAT— |	

Milestone 0 Milestone I/II Milestone III

No COEA Required
No STAR Required

Figure 8. ACAT IV Acquisition Process Alternative

establishing funding lines within AMC for CECOM and MICOM to manage the smallest development programs in their respective commodity areas.

2. Recommendations for Further Research

Because some of the ACAT IV managers contacted did not fully understand the DoD 5000 process and the standard terminology for acquisition programs, it is recommended that the training needs of ACAT IV managers be investigated. Note that ACAT IV level managers are not certified PMs and, as such, are not required to be as highly trained. However, because ACAT IV managers are typically civilians who do not have to rotate assignments every three years or less (as ACAT III Officers typically do), they may be fully effective as managers without additional training. Therefore, recommend a comparative analysis of the training requirements and experience levels of ACAT III (certified) and ACAT IV (non-certified) managers, to determine whether the experience and training of non-certified ACAT IV managers is adequate.

Considering the lack of statistically significant results from this study, it is recommended that further studies be conducted that concentrate on the most significant techniques, that investigate more in-depth the establishment of useful statistics, such as confidence intervals, for the expected levels of cost and schedule savings. A major goal of this study that was unrealized was the establishment of planning estimates of expected cost and schedule savings, for ACAT IV manager streamlining decision-making. This type of information would be of great benefit to the U.S. Army ACAT IV development community.

Based on the small number of ACAT IV managers in the U.S. Army and the Command differences regarding CECOM and MICOM (where all programs move up to at least ACAT III level), it is recommended that future research in this area consider both ACAT III and ACAT IV managers. The purpose would be twofold: (1) to study the differences between the two groups, and (2) if they prove to be similar, combine the two for statistical information concerning expected savings.

Based on a recent briefing by the Commander of Marine Corps Systems Command, MG Mutter, the Marine Corps has many more ACAT III and IV programs

than ACAT I and II, and they are actively streamlining wherever possible, challenging all requirements of the DoD 5000 process. Their small size and shorter chain-of-command provide for an easier source of data than was available for this study of Army programs and may create a streamlining atmosphere that the Army could learn from. Therefore, it is recommended that further research be conducted that considers both Army and Marine Corps programs.

Additionally, the following issues and streamlining techniques that were identified during the course of this study are recommended for more in-depth investigation:

1. The reasons cited most often by ACAT IV managers for their streamlining decisions; which were risk level, and Command structure and commodity differences.
2. The methods used for cross-fertilization of streamlining ideas among Commands.
3. Since quality was a consideration in the selection of at least one streamlining technique, validation of the support system in first production instead of during EMD, further research into how quality impacts the acquisition streamlining decision-making process.
4. Since procurement is as important to fielding of new systems as development, it is also recommended that ACAT IV procurement streamlining techniques be investigated in a separate, parallel effort.Included in this effort should be consideration of multi-year production contracting as a streamlining technique that can result in long-term cost and time savings.
5. Investigation of capstone Program Management Documentation such as TEMPs, ORDs as a streamlining technique. This would allow for the development of several related efforts without waiting for separate staffing and creation of multiple documents.

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APPENDIX A. ACAT IV POINTS OF CONTACT

COMMAND	NAME	PHONE NUMBER
Natick RD&E Center	Ken Rice	DSN 256-4883
Edgewood RD&E Center	Dave LaBar	DSN 584-5272
Aviation Applied Technology Directorate	Gene Birocco	DSN 927-2822
Missile Command	Dr. Gene Paro	DSN 746-1457
Communications & Electronics Command	Nancy Roberts	DSN 992-4159
Tank, Automotive and Armaments RD&E Center	Jack Petersen	DSN 786-6411
Armaments RD&E Center	Bill Blackwell	DSN 880-7044

APPENDIX B. ACAT IV MANAGER QUESTIONNAIRE

Tailoring of the DoD 5000 Acquisition Process

Data Required by the Privacy Act of 1974

Prescribing Directive: AR 70-1

Authority: 10 USC 4503

Principle Purpose: The data collected by this questionnaire is to be used for research purposes only.

Routine Uses: Full confidentiality of the responses will be maintained in the processing of this data.

Mandatory or Voluntary Disclosure and Effect on Individual Not Providing Information: Your participation in this research is strictly voluntary. Individuals are encouraged to provide complete and accurate information in the interests of the research, but there will be no effect on individuals for not providing all or any part of the information.

Questionnaire Instructions

The purpose of this questionnaire is to gather data on how Army ACAT IV development managers tailor the DoD 5000 acquisition process. You have been selected to receive this questionnaire because you have served as an ACAT development manager since the implementation of the newest revision of the DoD 5000 Series.

- Please answer each question on the following pages. If you feel unqualified to answer a particular question, leave it blank.

- Mark your answers directly on this questionnaire by placing an "X" over the appropriate box or writing in your response in the space provided.

- When completed, please return the entire questionnaire in the pre-addressed government envelope provided.

- Thank you.

A. Please estimate the following **ORDERS OF MAGNITUDE** totals for the project(s) tha: you have managed during the past 5 years (Total per project cost and duration estimates fo: the period from project initiation through the Milestone III decision).

1. Development Cost: [0-$500K] [$500K-$1M] [$1M-$3M] [$3M-$7M] [$7M-$15M] [$15M-$31M] [>$31M

2. Development Duration: [0-1 Years] [1-3 Years] [3-7 Years] [7-15 Years] [>15 Years

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B. For each of the following potential acquisition process tailoring methods, answer the following three questions, followed by narrative comments concerning what positive or negative factors lead you to these selections:

	a. Have you or would you consider using this method?		**b. How would you classify the cost savings potential of this method?**					**c. How would you classify the schedule reduction potential of this method?**				
	Yes [Y]	No [N]	$0-$100 [1]	$100-$1000 [2]	$1K-$10K [3]	$10K-100K [4]	>$100K [5]	0-7 Days [1]	1-4 Wks [2]	1-6 Mos [3]	6-18 Mos [4]	>18 Mos [5]
1. Combine Milestones O and I (Skip Concept Exploration Phase)	a. [Y]	[N]	b. [1]	[2]	[3]	[4]	[5]	c. [1]	[2]	[3]	[4]	[5]
2. Combine Milestones I and II (Skip Dem/Val Phase)	a. [Y]	[N]	b. [1]	[2]	[3]	[4]	[5]	c. [1]	[2]	[3]	[4]	[5]
3. Combine Milestones I and III (Skip Dem/Val & EMD Phases)	a. [Y]	[N]	b. [1]	[2]	[3]	[4]	[5]	c. [1]	[2]	[3]	[4]	[5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

What are the key factors that lead you to the above decisions?
a.

b.

c.

What are the key factors that lead you to the above decisions?
a.

b.

c.

4. Combine Dem/Val development test (DT) and operational test (OT) a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

5. Conduct concurrent (overlapping) Dem/Val DT and OT a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

6. Combine EMD DT and Initial Operational Test & Evaluation (IOT&E) a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

7. Conduct concurrent EMD DT and IOT&E a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

8. Conduct Customer Tests in lieu of formal DT in Dem/Val Phase a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

9. Conduct Customer Tests in lieu of formal DT in EMD Phase a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

10. Conduct user evaluation in lieu of formal IOT&E in EMD Phase — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4]

What are the key factors that lead you to the above decisions?
a.

b.

c.

11. Request Milestone Decision Authority delegate Milestone Decision Review Chairmanship to RDEC Management — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4]

What are the key factors that lead you to the above decisions?
a.

b.

c.

12. Request DA-Directed Procurement prior to Type Classification-Standard — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4]

What are the key factors that lead you to the above decisions?
a.

b.

c.

13. Staff Milestone Decision package prior to receipt of Independent Eval/Assess Reports (IER/IAR), with reports expected prior to the decision meeting. — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4]

What are the key factors that lead you to the above decisions?
a.

b.

c.

14. Use Interim Assess or Eval Reports to support a Milestone Decision, with decision contingent upon favorable Final Reports. — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4]

What are the key factors that lead you to the above decisions?
a.

b.

c.

15. Use an Independent Evaluator briefing in lieu of a report to support a Milestone Decision, with written report(s) to follow. a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

16. Waive requirement for a Cost and Operational Effectiveness Analysis (COEA) a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

17. Waive requirement for a separate System Threat Assessment Report (STAR) a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

18. Waive requirement for a separate Logistics Demonstration a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

19. Utilize TIWG as Electromagnetic Environ. Effects (E3) Requirements Board a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

20. Conduct abbreviated Logistics Support Analysis and Reporting (LSA/LSAR) a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5

What are the key factors that lead you to the above decisions?
a.

b.

c.

21. Don't prepare separate Configuration Management Plan a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5

What are the key factors that lead you to the above decisions?
a.

b.

c.

22. Don't generate Independent Life Cycle Cost Estimate a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5

What are the key factors that lead you to the above decisions?
a.

b.

c.

23. Obtain Milestone Decision Authority approval to solicit a contract prior to Milestone Decision Review a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5

What are the key factors that lead you to the above decisions?
a.

b.

c.

24. Utilize a single contract for Dem/Val and EMD Phases a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5

What are the key factors that lead you to the above decisions?
a.

b.

c.

25. Utilize a single contract for EMD and First Production — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

26. Conduct production First Article Tests to validate development deficiency corrections — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

27. Validate technical manuals/support system during First Production instead of during EMD — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

28. Other (specify) — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

29. Other (specify) — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

30. Other (specify) — a. [Y] [N] b. [1] [2] [3] [4] [5] c. [1] [2] [3] [4] [5]

What are the key factors that lead you to the above decisions?
a.

b.

c.

QUANTITATIVE RAW DATA BY QUESTION NUMBER

Manager	Command	Cost	Duration	1a	1b	1c	2a	2b	2c	3a
3	Natick	3	3	2	NA	NA	1	5	5	NA
7	Natick	4	3	1	5	5	1	5	5	1
9	Natick	3	3	1	1	3	1	1	4	1
10	Natick	5	2	1	4	4	1	5	4	1
11	Natick	5	4	1	5	4	1	5	4	1
13	Natick	1	2	2	3	3	1	3	3	2
14	Natick	6	4	1	4	4	1	5	4	1
16	Natick	3	3	1	4	4	1	5	4	1
17	Natick	6	3	1	4	4	1	5	4	2
21	ERDEC	7	3	1	5	5	1	5	5	2
22	ERDEC	5	3	1	4	4	1	5	4	2
48	AATD	6	3	1	5	5	1	5	5	1
49	AATD	2	3	2	NA	NA	1	4	3	1
60	ARDEC	6	2	1	5	4	1	5	4	2
63	ARDEC	1-4	3-7	1	3	3	2	NA	NA	2
64	ARDEC	1-4	3-7	1	3	3	2	NA	NA	2
67	ARDEC	7	3	2	5	3	1	5	4	2
69	ARDEC	2	2	NA	NA	NA	NA	NA	NA	1
70	ARDEC	3	2	1	3	3	1	4	4	1

QUANTITATIVE RAW DATA BY QUESTION NUMBER

Manager	3b	3c	4a	4b	4c	5a	5b	5c	6a	6b	6c
3	NA	NA	1	4	3	NA	NA	NA	1	4	3
7	5	5	1	4	4	1	1	3	NA	NA	NA
9	2	5	1	2	4	1	1	2	1	2	4
10	5	4	1	4	3	1	4	3	NA	NA	NA
11	5	4	1	5	3	2	1	3	1	5	3
13	4	3	1	3	3	1	3	3	2	1	NA
14	5	5	1	5	3	2	NA	NA	NA	NA	NA
16	5	5	1	5	4	2	4	3	1	5	4
17	NA	NA	1	5	4	1	4	3	1	5	4
21	NA	NA	2	NA	NA	1	5	5	1	5	5
22	NA	NA	2	NA	NA	1	4	3	2	NA	NA
48	5	5	1	4	3	1	4	3	1	4	3
49	4	3	1	5	4	1	4	3	1	4	4
60	NA	NA	2	NA	NA	2	NA	NA	1	5	4
63	NA	NA	1	4	NA	1	4	NA	NA	NA	NA
64	NA	NA	1	4	4	1	NA	NA	NA	NA	NA
67	NA	NA	1	NA	1	NA	NA	NA	NA	NA	NA
69	5	4	1	5	4	NA	NA	NA	NA	NA	NA
70	5	4	2	NA	NA	1	3	3	2	NA	NA

QUANTITATIVE RAW DATA BY QUESTION NUMBER

Manager	7a	7b	7c	8a	8b	8c	9a	9b	9c	10a	10b
3	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	1	1	2	1	1	2	2	NA	NA	1	2
10	NA	NA	NA	1	4	4	1	NA	NA	NA	NA
11	2	1	3	1	4	3	1	4	3	1	4
13	1	3	3	2	2	NA	2	2	NA	1	4
14	NA	NA	NA	1	1	1	1	1	1	1	5
16	2	5	4	1	4	3	2	2	3	1	5
17	1	4	3	2	NA	NA	2	NA	NA	1	5
21	1	5	5	2	NA	NA	2	NA	NA	1	5
22	1	4	3	1	3	3	2	NA	NA	1	4
48	1	4	3	1	3	3	1	3	3	1	4
49	1	4	4	1	4	4	1	4	4	1	4
60	1	5	4	2	NA	NA	2	NA	NA	2	NA
63	NA	NA	NA	2	NA	NA	2	NA	NA	NA	NA
64	NA	NA	NA	2	NA	NA	2	NA	NA	2	NA
67	NA	NA	NA	2	5	4	2	5	4	2	NA
69	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
70	1	3	3	2	NA	NA	2	NA	NA	1	NA

QUANTITATIVE RAW DATA BY QUESTION NUMBER

Manager	10c	11a	11b	11c	12a	12b	12c	13a	13b	13c	14a
3	NA	1	NA	3	NA	NA	NA	1	NA	3	1
7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	1	1	1	5	2	NA	NA	1	1	3	1
10	NA	1	2	2	1	4	2	1	NA	NA	1
11	3	1	3	3	1	1	5	1	3	3	1
13	2	1	4	3	NA	NA	NA	1	1	2	1
14	1	1	1	1	1	1	1	1	1	2	2
16	5	2	3	3	2	NA	NA	1	3	2	1
17	4	1	2	3	1	1	3	1	1	2	1
21	NA	1	NA	NA	1	NA	NA	1	NA	NA	1
22	3	2	NA	NA	2	NA	NA	1	NA	3	1
48	3	2	NA	NA	2	NA	NA	1	3	2	1
49	4	2	NA	NA	2	NA	NA	1	1	3	1
60	NA	1	5	5	2	NA	NA	1	1	3	1
63	NA	NA	NA	NA	NA	NA	NA	1	1	2	1
64	NA	NA	NA	NA	NA	NA	NA	1	1	2	1
67	NA	1	3	2	2	NA	NA	2	2	3	2
69	NA	2	NA	NA	NA	NA	NA	2	NA	NA	NA
70	NA	1	NA	NA	2	NA	NA	1	3	2	1

QUANTITATIVE RAW DATA BY QUESTION NUMBER

Manager	14b	14c	15a	15b	15c	16a	16b	16c	17a	17b	17c
3	NA	3	1	NA	3	1	4	3	1	NA	NA
7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	1	3	1	1	3	NA	NA	NA	NA	NA	NA
10	2	2	2	NA	NA	1	5	3	1	4	3
11	1	3	1	1	3	1	3	3	1	3	3
13	1	2	2	1	1	1	1	1	1	1	1
14	2	3	1	1	2	1	3	3	1	3	3
16	3	3	2	NA	NA	1	5	5	1	NA	NA
17	1	2	1	1	2	1	2	2	NA	NA	NA
21	NA	NA	2	NA	NA	1	NA	NA	2	NA	NA
22	3	3	1	3	3	1	4	3	1	3	3
48	3	2	1	2	2	1	4	3	1	1	3
49	1	3	2	NA	NA	2	NA	NA	1	NA	NA
60	1	3	1	2	3	2	NA		1	1	4
63	1	2	1	1	2	2	NA		NA	NA	NA
64	3	2	1	2	2	2	NA		NA	NA	NA
67	1	2	2	NA	NA	1	NA		1	2	4
69	NA	NA	2	NA	NA	2	NA		1	NA	NA
70	3	2	2	NA	NA	1	NA		NA	NA	NA

QUANTITATIVE RAW DATA BY QUESTION NUMBER

Manager	18a	18b	18c	19a	19b	19c	20a	20b	20c	21a	21b
3	1	4	3	NA	NA	NA	NA	NA	NA	NA	NA
7	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
9	1	1	3	NA	NA	NA	NA	NA	NA	1	NA
10	1	5	4	2	NA	NA	NA	NA	NA	NA	NA
11	1	4	3	1	NA	NA	1	3	3	NA	NA
13	1	5	3	1	1	1	1	4	3	1	3
14	1	5	3	1	1	3	2	5	3	NA	NA
16	1	5	4	1	NA	NA	1	4	3	1	4
17	1	3	3	NA	NA	NA	NA	NA	NA	NA	NA
21	2	NA	NA	1	NA	NA	1	NA	NA	2	NA
22	NA	NA	NA	1	3	3	NA	NA	NA	1	3
48	1	3	2	1	1	2	1	5	4	1	4
49	1	4	3	NA	NA	NA	1	4	3	1	2
60	1	NA	NA	2	NA	NA	2	NA	NA	2	NA
63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
64	NA	NA	NA	NA	NA	NA	1	NA	NA	NA	NA
67	2	NA	NA	2	NA	NA	2	NA	NA	2	NA
69	1	NA	NA	1	NA	NA	2	NA	NA	2	NA
70	NA	NA	NA	1	3	2	1	3	3	NA	NA

QUANTITATIVE RAW DATA BY QUESTION NUMBER

Manager	21c	22a	22b	22c	23a	23b	23c	24a	24b	24c	25a
3	NA	2	NA	NA	1	NA	3	1	NA	4	1
7	NA	NA	NA	NA	NA	NA	NA	1	1	4	1
9	NA	NA	NA	NA	1	1	5	1	2	5	1
10	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
11	NA	NA	NA	NA	1	3	3	1	3	3	1
13	3	1	3	3	1	3	3	1	3	3	1
14	NA	1	2	2	2	1	3	1	4	4	1
16	4	2	NA	NA	1	4	4	1	5	5	2
17	NA	NA	NA	NA	1	1	3	1	4	4	1
21	NA	2	NA	NA	2	NA	NA	1	5	5	1
22	3	2	NA	NA	1	3	3	NA	NA	NA	NA
48	2	1	4	3	1	1	3	1	NA	NA	1
49	2	2	NA	NA	2	NA	NA	1	4	4	1
60	NA	2	NA	NA	2	NA	NA	1	NA	NA	2
63	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	2
64	NA	NA	NA	NA	NA	NA	NA	1	2	3	2
67	NA	2	NA	NA	1	NA	NA	2	NA	NA	1
69	NA	1	NA	NA	2	NA	NA	2	NA	NA	2
70	NA	2	NA	NA	NA	NA	NA	1	NA	NA	2

QUANTITATIVE RAW DATA BY QUESTION NUMBER

Manager	25b	25c	26a	26b	26c	27a	27b	27c
3	NA	4	NA	NA	NA	1	NA	3
7	NA	NA	1	NA	NA	NA	NA	NA
9	3	5	1	NA	NA	1	2	3
10	NA	NA	NA	NA	NA	NA	NA	NA
11	3	3	2	4	3	2	1	1
13	4	3	1	4	3	2	NA	NA
14	5	5	1	NA	NA	2	NA	NA
16	NA	NA	1	4	4	1	NA	NA
17	3	4	1	3	3	1	3	2
21	5	5	1	5	5	1	5	5
22	NA	NA	1	3	3	1	3	3
48	5	5	1	4	3	1	4	3
49	4	3	1	NA	NA	1	NA	NA
60	NA	NA	1	2	4	2	NA	NA
63	NA	NA	2	NA	NA	1	NA	NA
64	NA	NA	2	NA	NA	1	3	NA
67	5	4	2	NA	NA	2	NA	NA
69	NA	NA	1	NA	NA	1	NA	NA
70	NA	NA	2	NA	NA	NA	NA	NA

APPENDIX D. QUESTIONNAIRE NARRATIVE COMMENTS RAW DATA

1. Combine Milestones 0 and I (Skip Concept Exploration (CE) Phase)

Respondent 7:
- a. Items always of low technical risk and do not warrant concept exploration

Respondent 9:
- a. Small programs usually don't need to prove out technology to the extent of more complex ones

Respondent 10:
- a. Most ACAT IV efforts have NDI or NDI-adaptation solutions
- b. The technology being considered is generally mature
- c. Milestone 0 has very little value added for ACAT IV efforts

Respondent 11:
- a. Maturity of technology
- b. Airdrop testing costs
- c. Availability of test support (i.e. aircraft)

Respondent 13:
- a. No, this is an essential phase of R&D

Respondent 14:
- a. The potential success of a concept most of the time can only be proven out by trying to build a prototype
- b. The total manpower costs and schedule associated with doing a Milestone 0 will be somewhat costly. Today we are told that we need to deliver products in a few years, doing an additional step doesn't streamline the process

Respondent 16:
- a. By DoD 5000 Milestone 0 occurs when the MNS is approved. Because of time constraints almost all of our programs are started before the MNS is officially approved. Therefore technically we are in Dem/Val and our MNS is approved and available for Milestone I

Respondent 17:
- a. Most ACAT IV items do not require a C.E. phase, most issues can be resolved in Dem/Val or EMD

Respondent 21:
- a. Cost savings, schedule reduction

Respondent 22:
- a. Not much difference between MS 0 and I. These days if your program is ready for MS 0, you're probably ready for MS I

Respondent 48:
- a. Basic technologies identified, moderate risk
- b. Need identified (MNS)
- c. Type of funding available (6.3, 6.4, and 6.5)

Respondent 49:
- a. No, concept exploration is useful in determining system characteristics/configuration that meets the requirement, I feel it is needed
- b. Cost of this phase will not be reduced, but overall costs may be reduced
- c. Schedule in this phase will not be shortened, but overall schedule may be

Respondent 60:
- a. NDI approach
- b. Cost of development born by contractor
- c. Missing acquisition cycle step

Respondent 63:
- a. Complexity of contemplated design change/improvement
- b. Evaluate associated risk in skipping the Concept Exploration Phase

Respondent 64:
- a. Complexity of contemplated requirements, evaluate risk in skipping Concept Exploration phase

Respondent 70:
- a. Contingent upon the clear, obvious demonstration of feasible concepts/technologies to be applied

2. Combine Milestones I and II (Skip Demonstration/Validation (Dem/Val) Phase)

Respondent 3:
- a. Shortens time and reduces number of documents, but allows for two generations of prototype development prior to MS III

Respondent 7:
a. Items are typically of moderate technical risk and usually do not warrant Dem/Val prior to EMD

Respondent 9:
a. We are normally able to start building prototypes of the items we will test early on
b. Funding for development is always in short supply, we usually have to prove out our chosen design while we are building the test items

Respondent 10:
a. Most ACAT IV efforts have NDI or NDI-adaptation solutions
b. The technology being considered is generally mature, Milestone II is generally only useful for efforts with unproven technology

Respondent 11:
a. Maturity of technology, level of success during Concept Exploration
b. Airdrop testing costs
c. Availability of test support (i.e. aircraft)

Respondent 13:
a. This methodology seems to be taking place already

Respondent 14:
a. For our programs, seems like its a repetition of building a concept/prototype and then test
b. Cost and time constraints

Respondent 16:
a. NDI solution was not acceptable because after early DT testing the ORD requirements were not met. Therefore, the program was changed from I/III milestone decision (one milestone) to the next which is I/II and III (two milestones)

Respondent 17:
a. Most ACAT IV items do not require a C.E. phase, most issues can be resolved in Dem/Val or EMD

Respondent 21:
a. Cost savings, schedule reduction

Respondent 22:
a. We did it

Respondent 48:
a. Basic technologies identified, low risk
b. Need identified (MNS)
c. Type of funding available (6.3 and 6.5)

Respondent 49:
a. Off-the-shelf items or even items that have been developed and are low risk do not need to follow an extensive Dem/Val, I would consider skipping
b. The cost will be reduced because you use off-the-shelf items
c. The schedule will be shortened because off-the-shelf items can be procured quickly

Respondent 60:
a. NDI approach
b. Cost of development born by contractor
c. Missing acquisition cycle step

Respondent 63:
a. No, Dem/Val is essential to the development effort
b. Unnecessary to assume risk when test costs are relatively small
c. Test costs following the Dem/Val Phase escalate greatly

Respondent 64:
a. No, no reason to assume risk when test costs are low, after Dem/Val phase costs of tests are high

Respondent 67:
a. We are in fact using this approach. Procurement lead time savings are substantial

Respondent 70:
a. Contingent upon the verifiable, creditable demonstration of technologies considered, must take into account the level of maturity of given technology/solution

3. Combine Milestones I and III (Skip Dem/Val and Engineering & Manufacturing Development (EMD) Phases)

Respondent 7:
a. Items are sometimes simple and pose little risk by going directly to Milestone III

Respondent 9:
a. This is my favorite and we are doing it for the Modular General Purpose Tent System.

Since we normally only have one shot at building items we can normally do a MS I/III
b. It saves test and prototype costs
c. It lets us do 2-3 year programs vs. 5-7 years, very important to cut time out, the user is demanding quicker turn-around

Respondent 10:
a. Done it
b. The maturity of most ACAT IV technology lends itself to pursuing a combined Milestone I/III
c. P3I efforts can fix the few issues left unresolved after Milestone III

Respondent 11:
a. Maturity of technology, documented early successful testing
b. Airdrop testing costs are high
c. Availability of test assets

Respondent 13:
a. No, by skipping the EMD Phase, your R&D effort would be left up to the contractor once you go to production. The Army would not know the history of their own programs

Respondent 14:
a. Not applicable to all systems, combining the two for an NDI makes sense. For a non-NDI need to have a check point in between Milestones I and II to make sure all IPR members sign on to a concept. In light of going away from drawings/specs, on the other hand, why have extra milestones if you are Type Classifying a concept. Obviously, eliminating some schedule will save time but could result in money being put into a dead end if nobody likes the concept.

Respondent 16:
a. This is done for all NDI solutions. This is the first thing we look at for our programs, because the 5000 series requires NDI solution before any government development. This also allows the fastest and cheapest development which is important for ACAT IV programs

Respondent 17:
a. No, I think you always need to do EMD to prove-out technical issues

Respondent 22:
a. No, too much rushing of development

Respondent 48:
a. Basic technologies identified, probably NDI/modified NDI
b. Need identified (MNS and ORD)
c. Type of funding available

Respondent 49:
a.Off-the-shelf or low risk technology are ideally suited for combining these phases because little Dem/Val or EMD effort is needed. I am currently combining I and III for an ACAT IV program
b. Cost will be reduced because of reduction in work
c. Schedule will be shortened also

Respondent 60:
a. No, disaster lurks - key stop is producibility and safety for armaments, must do EMD

Respondent 63:
a. No, Dem/Val is essential to the development effort
b. Unnecessary to assume risk when test costs are relatively small
c. Test costs following the Dem/Val Phase escalate greatly

Respondent 64:
a. No, no reason to assume risk when test costs are low, after Dem/Val phase costs of tests are high

Respondent 67:
a. No, unacceptable program risk with this approach. Large number of test quantities in EMD discourage elimination of EMD Phase

Respondent 69:
a. Up to 5 contractors had non-developmental items potentially capable of meeting requirements in performance spec and ROC. Contractors were willing to provide 3 bid samples for testing, at no cost to the government, as part of the solicitation process, leading to a multiyear (5 year) production contract. Milestone III production decision IPR judged the acceptability of the contractors test results prior to award. Contract obtaining both production hardware and data for transition to organic support after 2 - 3 years of interim contractor support. Potential for cost savings was great due to competition

Respondent 70:
a. In support of an NDI acquisition, our team was able to combine Milestones I and III rather effectively with total management support, this streamlining or tailoring decision was a

common sense approach as the hardware was developed and available as a commercial off-the-shelf

4. Combine Dem/Val Development Test (DT) and Operational Test (OT)

Respondent 3:
- a. DT with user troops is sufficient to identify and verify user issues

Respondent 7:
- a. DT/OT is a reasonable alternative for relatively simple items with few operational issues, small emphasis on OT

Respondent 9:
- a. Time saver, cost saver on number of prototypes needed, testing, and reporting
- b. Often difficult to get OEC and TEXCOM to agree

Respondent 10:
- a. Testing on ACAT IV efforts is often overdone
- b. Proper engineering work can limit required testing
- c. Many DT issues can be looked at during a thorough OT

Respondent 11:
- a. Time, maximize return from testing costs
- b. Airdrop testing costs
- c. Length of an airdrop OT

Respondent 14:
- a. If TECOM does it, yes. TEXCOM, if in the lead, is extremely costly and manpower intensive and doesn't do well in measuring technical parameters. Our RAM driven tests are extremely similar to TEXCOM's OT: Mission profiles are followed. OT tests for CBPS cost approximately $700K versus one DT test is approximately $150K

Respondent 16:
- a. Cost
- b. Time, because the ORD has to be approved before you can be in the TSARC (which you have to be in a year before OT) which is never the case here

Respondent 17:
- a. Makes a lot of sense, there is often overlap between technical and operational issues, separate tests stretch-out the schedule too much

Respondent 21:
- a. No, it will be too costly in case of gross failures

Respondent 22:
- a. No, too hard to schedule OT troops

Respondent 48:
- a. Degree of testing required
- b. Ability to simultaneously collect technical and operational data
- c. Ability to get concurrence from DT and OT testers/evaluators

Respondent 49:
- a. Off-the-shelf items should not need very much DT/OT testing because of the low technology risks. I have considered this but it is difficult to convince the testing folks that testing is not required or should be limited
- b. Cost of testing is very expensive
- c. Schedule can be greatly shortened, in some situations the acquisition cycle can be cut in half

Respondent 60:
- a. No, can't man-fire during Dem/Val to support OT

Respondent 63:
- a. Combining DT/OT will make testing more cost effective, i.e., save time and funds

Respondent 64:
- a. Save cost, save time

Respondent 67:
- a. Artillery ammunition typically does not require OT

Respondent 69:
- a. Bid sample testing at APG demonstrated system performance and also conducted environmental testing which was the equivalent of DT testing. Combat Developer agreed to conduct an operational evaluation of the system during bid sample testing so they could provide an independent assessment for the IPR

Respondent 70:
- a. No, we as developers may be biased when considering the performance/effectiveness of systems under development. Truly recommend maintaining an independent operational test or user test, customer test, etc.. This provides developers a fresh perspective from customers

eyes (not just user representatives)

5. Conduct concurrent (overlapping) Dem/Val DT and OT

Respondent 7:
a. Only useful as a means of accelerating test schedule

Respondent 9:
a. OK, but probably not worth fighting for, this wouldn't save you that much

Respondent 10:
a. Program dependent - easy to accomplish with smaller items and many prototypes

Respondent 11:
a. Doesn't maximize return on testing costs, only saves time. Would conduct only if directed to
b. There would be no savings because you are duplicating efforts
c. The concurrent nature would save time

Respondent 14:
a. No, if any problems discovered at DT and you can't correct them, you are in trouble in OT. If the system is doing poorly in RAM the test will be terminated. OEC wants production representative systems

Respondent 16:
a. Try to remove operational testers from the process, because of cost and time. Also they make the ACAT IV program act like a ACAT I, which we can never do because of time and money

Respondent 17:
a. Separate tests take too long
b. Overlap of DT and OT issues
c. May require more test items than are affordable

Respondent 22:
a. Any concurrency is good

Respondent 48:
a. Degree of testing required
b. Ability to simultaneously collect technical and operational data
c. Ability to get concurrence from DT and OT testers/evaluators

Respondent 49:
a. One test program should meet the testing requirements for the program, this idea should be the way all testing should be done, currently it is almost impossible to conduct one test
b. Costs would be reduced, one test would cost far less than three separate tests
c. Schedule would be greatly shortened

Respondent 60:
a. No, can't man-fire during Dem/Val to support OT

Respondent 63:
a. Combining DT/OT will make testing more cost effective, i.e., save time and funds

Respondent 64:
a. Save cost, save time

Respondent 70:
a. Definitely support this, DT/OT not necessarily dependent on each other. Concurrent testing will bring you to completion quicker, shorten project schedule, save labor dollars

6. Combine EMD DT and Initial Operational Test & Evaluation (IOT&E)

Respondent 3:
a. DT with user troops is sufficient to identify and verify user issues

Respondent 9:
a. Time saver, cost saver on number of prototypes needed, testing, and reporting
b. Often difficult to get OEC and TEXCOM to agree. Keep in mind that Natick does not always do separate Dem.Val, OT, EMD, and IOT&E even now

Respondent 11:
a. Prior success rate of testing which would reduce risk and increase confidence for success in the combined effort
b. Airdrop testing costs
c. Normal IOT&E time allotments for airdrop

Respondent 14:
a. ?

Respondent 16:
a. Start with NDI solution so most of our testing is this type DT combined with IOT&E

Respondent 17:
a. Makes a lot of sense, there is often overlap between technical and operational issues, separate tests stretch-out the schedule too much
Respondent 21:
a. Cost savings, schedule reduction
Respondent 22:
a. No, too hard to schedule troops
Respondent 48:
a. Degree of testing required
b. Ability to simultaneously collect technical and operational data
c. Ability to get concurrence from DT and OT testers/evaluators
Respondent 49:
a. One test program should meet the testing requirements for the program, this idea should be the way all testing should be done, currently it is almost impossible to conduct one test
b. Costs would be reduced, one test would cost far less than three separate tests
c. Schedule would be greatly shortened
Respondent 60:
a. IOT&E conducted as part of EMD, following man rating
Respondent 64:
a. ?
Respondent 70:
a. No, we as developers may be biased when considering the performance/effectiveness of systems under development. Truly recommend maintaining an independent operational test or user test, customer test, etc.. This provides developers a fresh perspective from customers eyes (not just user representatives)

7. Conduct concurrent (overlapping) EMD DT and IOT&E
Respondent 9:
a. OK, but probably not worth fighting for. This wouldn't save you that much
Respondent 11:
a. Only if forced to, results in time savings only
b. Results in no cost savings, because testing still must be completed
c. The concurrent nature will save time
Respondent 14:
a. ?
Respondent 16:
a. No, if you try to involve the operational testers you will have big problems with money, time, and test constraints
Respondent 17:
a. Separate tests take too long
b. Overlap of DT and OT issues
c. May require more test items than are affordable
Respondent 21:
a. Cost savings, schedule reduction
Respondent 22:
a. Concurrency is good (if you have the manpower to observe both)
Respondent 48:
a. Degree of testing required
b. Ability to simultaneously collect technical and operational data
c. Ability to get concurrence from DT and OT testers/evaluators
Respondent 49:
a. One test program should meet the testing requirements for the program, this idea should be the way all testing should be done, currently it is almost impossible to conduct one test
b. Costs would be reduced, one test would cost far less than three separate tests
c. Schedule would be greatly shortened
Respondent 60:
a. IOT&E conducted as part of EMD, following man rating
Respondent 64:
a. ?
Respondent 70:
a. Definitely support this, DT/OT not necessarily dependent on each other. Concurrent testing will bring you to completion quicker, shorten project schedule, save labor dollars

8. Conduct Customer Tests in lieu of a formal Development Test in Dem/Val Phase

Respondent 9:
- a. Good idea, gets the customers input up front, TIWG may be a tough sell on this
- b. Not a huge cost saver up front, but could identify problem areas early which could save money

Respondent 10:
- a. Definite advantages for very mature technologies and NDI efforts

Respondent 11:
- a. If technical evaluators allow, it provides flexibility in selecting test sites, i.e. other than TECOM assets
- b. Looking for lower cost test support
- c. New test site could also save time if private sector

Respondent 13:
- a. No, R&D DT is very different from Customer Testing

Respondent 14:
- a. No difference, cost and schedule the same. The only thing to worry about is that will TECOM accept the results of a customer test

Respondent 16:
- a. Speed, this allows for a quick test, short lead time
- b. Can send prototypes that are not 100% ready, also can send technicians to support test, have more direct control of test

Respondent 17:
- a. Good idea, but the current philosophy of the testers and evaluators is that customer tests don't count, i.e., can't use results for type classification decision

Respondent 21:
- a. No, you need to know if system works before giving it to the troops

Respondent 48:
- a. Degree of testing required
- b. Capabilities of Government test facilities vs. industry and cost differential

Respondent 49:
- a. This method is more customer oriented so you know exactly if your product meets the users requirements, the test agency may not have an appreciation for the critical issues and issues that are not that critical
- b. Costs would be reduced
- c. Schedule would be greatly shortened

Respondent 60:
- a. No, little advantage, must keep comm. involved, leads to formal DT/TT with TEMP

Respondent 63:
- a. No, conduct of formal Dem/Val DT reduces risk of future formal test efforts

Respondent 64:
- a. No, formal DT in Dem/Val, reduce risk

Respondent 67:
- a. No, artillery requires safety tests

Respondent 70:
- a. No, I considered operational testing same as customer tests, if OT is not structured as a customer test then it should be. In any event conducting customer tests in place of DT may not allow us to measure system effectiveness without imposing lengthy customer tests (i.e., years)

9. Conduct Customer Tests in lieu of a formal Development Test in EMD Phase

Respondent 9:
- a. I think we have to get formal, structured testing sometime
- b. I think customer testing this late in the design process might create chaos

Respondent 10:
- a. Definite advantages for very mature technologies and NDI efforts

Respondent 11:
- a. If technical evaluators allow, it provides flexibility in selecting test sites, i.e. other than TECOM assets
- b. Looking for lower cost test support
- c. New test site could also save time if private sector

Respondent 14:
- a. No difference, cost and schedule the same. The only thing to worry about is that will TECOM accept the results of a customer test

Respondent 16:

a. No, at this stage of program it is hard to substitute customer tests for more formal DT by TECOM. Also, would get better information from TECOM test

Respondent 17:

a. Good idea, but the current philosophy of the testers and evaluators is that customer tests don't count, i.e., can't use results for type classification decision

Respondent 22:

a. No, still need independent tester/evaluator

Respondent 48:

a. Degree of testing required
b. Capabilities of Government test facilities vs. industry and cost differential

Respondent 49:

a. This method is more customer oriented so you know exactly if your product meets the users requirements, the test agency may not have an appreciation for the critical issues and issues that are not that critical
b. Costs would be reduced
c. Schedule would be greatly shortened

Respondent 60:

a. Little advantage, must keep comm. involved, leads to formal DT/TT with TEMP

Respondent 63:

a. No, conduct of formal Dem/Val DT reduces risk of future formal test efforts

Respondent 64:

a. No, formal DT in Dem/Val, reduce risk

Respondent 67:

a. No, artillery requires safety tests

Respondent 70:

a. No, I considered operational testing same as customer tests, if OT is not structured as a customer test then it should be. In any event conducting customer tests in place of DT may not allow us to measure system effectiveness without imposing lengthy customer tests (i.e., years)

10. Conduct user evaluation in lieu of formal IOT&E in EMD Phase

Respondent 9:

a. This is the whole point of IOT&E
b. Might get better information from real users

Respondent 11:

a. If the operational evaluators approve of an alternative test site
b. Seek out lowest testing costs
c. May save time

Respondent 13:

a. Customer focus, see what the user wants/needs not the operational people at OEC

Respondent 14:

a. Formal IOT&E are extremely expensive, need all logistics products (i.e. LSA reports, RPSTLs, maintenance tasks, training, TMs) fully developed

Respondent 16:

a. Try to conduct any testing that substitutes for formal OT because of the operational testers treatment of ACAT IV programs

Respondent 17:

a. Makes sense for most Natick items. Formal OT should be for large, complex systems

Respondent 21:

a. Cost savings

Respondent 22:

a. Have yet to participate in well organized OT

Respondent 48:

a. Degree of testing required
b. Capabilities of Government test facilities vs. industry and cost differential

Respondent 49:

a. This method is more customer oriented so you know exactly if your product meets the users requirements. The test agency may not have an appreciation for the critical issues and issues that are not that critical
b. Costs would be reduced
c. Schedule would be greatly shortened

Respondent 60:

a. No, need formal IOT&E to get OEC support for milestone

Respondent 64:

a. No, formal DT in Dem/Val, reduce risk

Respondent 70:

a. The intent of any OT should be user evaluation. See no cost/time benefit. However will allow for a system truly reflecting user requirements. We need to focus and listen to user to meet their expectations

11. Request Milestone Decision Authority delegate Milestone Decision Review Chairmanship to RDEC Management

Respondent 3:

a. Much quicker and simpler

Respondent 9:

a. Empowerment
b. Potential for quick turn-around is unlimited
c. Type Classify when the system is ready, not just when the bureaucracy is satisfied and has spent all the money

Respondent 10:

a. The MDR chairmanship should be at the lowest possible working level

Respondent 11:

a. Time savings, ease of coordination with an on-site activity
b. Eliminate travel costs
c. Reduces coordination time

Respondent 13:

a. RDEC management will know your program - where an MDA is just signing on the dotted line

Respondent 14:

a. No advantage in cost and schedule, having it in the RDEC aids in that the MDA can be more involved in the program when in the RDEC. Now the MDA only gets involved in high visibility programs

Respondent 16:

a. No, current change in Natick has the MDA being established at Natick because of the starting of SSCOM

Respondent 17:

a. Current MDA at ATCOM is not close enough to the development program

Respondent 22:

a. No, like having general officer sign it

Respondent 48:

a. No, see no benefit

Respondent 49:

a. No, the materiel developer knows the requirement for fielding items and he is the manager of that item when it is in the field, RDEC should not be responsible for making that decision

Respondent 60:

a. System being non-complex
b. Schedule streamlining
c. Precedence set previously

Respondent 64:

a. ?

Respondent 67:

a. With new command, ARDEC has not yet got this authority

Respondent 69:

a. No, production decision IPR package (signed by CDR, ARDEC) was assembled with test reports and development and operational independent assessments supporting a Type Classification Standard recommendation and recommending award of the multi-year production contract

Respondent 70:

a. This is being done today, thus have not implied time/cost benefit

12. Request DA-Directed Procurement prior to Type Classification-Standard

Respondent 9:

a. No, confuses issues
b. More bureaucracy
c. I may be missing some finer points on this one

Respondent 10:

a. No, considered it - actually a very difficult task, over 18 different wickets to go through,

not an effective method under current system

Respondent 11:
a. Only if the customer/user has an immediate need
b. Costs will still be incurred to achieve the Type Classification
c. Time savings to initial fielding will be achieved, not Type Classification

Respondent 14:
a. Probably no change in cost and schedule. With no more specs, we could maybe combine RDTE into the production phase. The advantage of having DA directed procurement is that with money in production it helps keep funds in RDTE program, ensures user and IPR members support. Part of our streamlining theory that we shall not develop anything the Army doesn't want to buy

Respondent 16:
a. No, have never done this for any of my programs and can not see any advantages

Respondent 17:
a. This was done on SICPS tent, needed to get items fielded even though RDTE was not 100% complete. Makes sense because the soldier would rather have an 85% solution now than wait 2 years for the 100% solution

Respondent 21:
a. Prove out technical data package

Respondent 22:
a. No, can't see why this would be a good idea

Respondent 48:
a. No, see no benefit

Respondent 49:
a. No, no benefit

Respondent 60:
a. No, Program directed competition

Respondent 64:
a. ?

Respondent 70:
a. No, This is inconsistent with shelving technology (i.e., develop system, finalize TDP, and have available for procurement with no POM forecasts)

13. Staff Milestone Decision Package prior to receipt of Independent Evaluation/Assessment Reports (IER/IAR), with reports expected prior to the decision meeting

Respondent 3:
a. This will speed up program substantially

Respondent 9:
a. Time saver!
b. Tough sell to TIWG/JWG

Respondent 10:
a. Gets much of the staff review accomplished without waiting for late test reports, has worked well in the past for us

Respondent 11:
a. Level of confidence the favorable reports will receive
b. Travel costs
c. Time saved from holding an additional one or two meetings

Respondent 13:
a. This would familiarize the MDA with your program

Respondent 14:
a. If you have to meet a Type Classification date, the evaluators can just present their assessments at the IPR provided they tell you their issues beforehand so there are no surprises. If you have the reports the advantage is that maybe you can avoid the IPR and just do it by correspondence

Respondent 16:
a. Time, need the MDS III to be done in time to start the production procurement actions (transition to ATCOM). Delays could cost loss of procurement funding

Respondent 17:
a. Final reports take too long, results are usually known long before final report

Respondent 21:
a. Time savings

Respondent 22:
a. Pretty risky - are IPR participants willing to bring positions to meeting without final

reports?
Respondent 48:
a. Shorten milestone decision process
Respondent 49:
a. I would try this method to expedite the Milestone Decision Reviews, although the IER/IAR are usually received in a timely fashion
b. Costs are not significant
c. Sometimes it could shorten the schedule significantly
Respondent 60:
a. Smart business decision, low risk
Respondent 63:
a. Staffing prior to receipt of IER/IAR will reduce response time for Type Classification position statement
Respondent 64:
a. Reduce response time
Respondent 69:
a. No, preliminary staffing was done with preliminary assessments but final assessments were available for formal Milestone III IPR production decision
Respondent 70:
a. Manager should have clear knowledge of DT/OT test results and willing to accept responsibility for IARs content, this action saves time

14. Use Interim Assessment or Evaluation Reports to support a Milestone Decision, with decision contingent upon favorable Final reports
Respondent 3:
a. This will speed up program substantially
Respondent 9:
a. More time saved
b. Gives assessor/evaluator time to do the reports right
Respondent 10:
a. Definite time saver with little risk
Respondent 11:
a. Provided the data in the interim reports will be favorable for the decision
b. Little to no cost savings
c. Time saved from waiting for the final reports
Respondent 13:
a. This would keep the decision process moving forward instead of standing still waiting for final reports
Respondent 14:
a. Sounds risky, if the IPR signs up to something, they should stick to it. Since the final decision isn't made until final reports are there, what is the point
Respondent 16:
a. Time, need the MDS III to be done in time to start the production procurement actions (transition to ATCOM). Delays could cost loss of procurement funding
Respondent 17:
a. Usually, not much changes between the interim and the final report
Respondent 21:
a. Cost/time savings
Respondent 22:
a. Great idea if evaluators are willing to do so. Currently an interim report is just as hard to get as final so we push for final
Respondent 48:
a. Shorten milestone decision process
Respondent 49:
a. I would try this method to expedite the Milestone Decision Reviews, although the IER/IAR are usually received in a timely fashion
b. Costs are not significant
c. Sometimes it could shorten the schedule significantly
Respondent 60:
a. Smart business decision, low risk
Respondent 63:
a. Use of interim reports/with contingency statement will reduce response times
Respondent 64:

a. Do most of the decision pending receipt of final report

Respondent 70:

a. Sounds reasonable as long as evaluator is willing to bless off on an interim assessment that conveys his/her position

15. Use Independent Evaluator Briefing in lieu of a reports to support a Milestone Decision, with written report(s) to follow

Respondent 3:

a. This would be the quickest method

Respondent 9:

a. Common sense, MDR should believe evaluator
b. More and more time saved
c. Gets item to the field quicker

Respondent 10:

a. Hadn't considered - but a good idea

Respondent 11:

a. Convenience/time
b. Shouldn't affect cost
c. Save the time that would be lost waiting for the final report

Respondent 14:

a. If you have to meet a Type Classification date, the evaluators can just present their assessments at the IPR provided they tell you their issues beforehand so there are no surprises. If you have the reports the advantage is that maybe you can avoid the IPR and just do it by correspondence. They can't be allowed to change their position in the report versus briefing

Respondent 16:

a. They normally attend milestone decision and give this briefing no matter the status of the evaluation

Respondent 17:

a. The important thing is to get the information to the IPR and MDA, if a briefing can accomplish this why wait for the written report?

Respondent 22:

a. Sounds simpler, but how do you ensure loop is closed i.e., receipt of reports?

Respondent 48:

a. Shorten milestone decision process

Respondent 49:

a. No, I don't see benefit

Respondent 60:

a. Independent evaluator and key team member

Respondent 63:

a. Only if the milestone decision requires a formal briefing that could not be accomplished by correspondence

Respondent 64:

a. If well documented

Respondent 70:

a. No, I consider an interim assessment for milestone decision but not briefing. Why? - May circumvent accountability - what if independent evaluator is not available (sick, training), program momentum could require a delegated representative or stand-in convey critical position with decreasing knowledge and accountability

16. Waive requirement for a Cost and Operational Effectiveness Analysis (COEA)

Respondent 3:

a. Unnecessary for ACAT IV programs

Respondent 9:

a. I don't know, when would cost analysis be done and by whom?
b. Incumbent on the developer to have figures developed
c. Empowerment

Respondent 10:

a. Very expensive and generally useless document

Respondent 11:

a. Depends on the procurement numbers associated with the effort, if the system requirement is not strong, the document may prove beneficial when selling the program
b. Cost to create the document
c. Time saved from preparing the document

Respondent 14:
a. Don't think we do this for ACAT IVs
Respondent 16:
a. The cost for a COEA is usually equal to the total cost for the whole RD&E effort. TRADOC is deciding if all ACAT IIIs and IVs will be excluded from the COEA requirement
Respondent 17:
a. It is impossible to be very accurate. This applies mostly to large, high cost systems
Respondent 22:
a. Haven't had a COEA done that reflects realistic development item usage, COEA personnel unable to become familiar with item
Respondent 48:
a. Relative cost of product, degree of user support
Respondent 49:
a. No, this document is needed to determine cost savings which is a major part of the decision process. It also provides information for budgeting purposes
Respondent 60:
a. No, need to assure that investment is smart
Respondent 63:
a. No, this should be a TRADOC decision
Respondent 64:
a. No, this is the training school decision
Respondent 70:
a. Conceptually, COEAs are great. They allow decision maker to justify their actions and developmental efforts. Unfortunately the level of effort involved for a small program can reduce any if not all benefits. Do not see as benefit to customer for small dollar programs - only value to manager for justifying

17. Waive requirement for a separate System Threat Assessment Report (STAR)
Respondent 9:
a. ?
Respondent 10:
a. Most items at Natick have no impact on threat
Respondent 11:
a. If the system will be in a limited or no combat environment
b. Cost to create the document
c. Time saved from preparing the document
Respondent 14:
a. Don't think we do this for ACAT IVs
Respondent 16:
a. Not required for ACAT IV programs as a separate document, usually included in the ORD
Respondent 22:
a. Especially for ACAT IV, another big group of people that can't take time to know item
Respondent 48:
a. Generally not needed or applicable for aviation ground support equipment
Respondent 49:
a. I do not understand the requirement for this report
Respondent 60:
a. Common sense
Respondent 64:
a. ?
Respondent 69:
a. Determination made that this was not required

18. Waive requirement for a separate Logistics Demonstration
Respondent 3:
a. Logistics issues can be determined in DT
Respondent 9:
a. We are doing this now, it works. The log folks have plenty of opportunities to input their information requirements at TIWGs
Respondent 10:
a. A very expensive and generally unnecessary event for most ACAT IV efforts
Respondent 11:
a. Yes, if during operational testing data was taken to show usability and maintainability of the

product
b. Cost to set up test and TDY
c. Time saved from setting up and holding the log demo

Respondent 14:
a. Only if the TIWG concurs, particularly OEC and schools that will do maintenance on your system, depends on complexity of system

Respondent 16:
a. Usually include any Log Demo requirements in the First Article Tests because that is usually the first time the system is produced according to the spec

Respondent 17:
a. Should be done as part of the OT or DT/OT

Respondent 48:
a. Aviation ground support equipment is logistics-related equipment, so Log Demo may be redundant testing

Respondent 49:
a. Logistics for off-the-shelf items are limited, also the contractor can provide logistics support
b. Cost of a Logistics Demonstration can be eliminated
c. Schedule can be reduced

Respondent 60:
a. Not required for ammo items

Respondent 64:
a. ?

Respondent 69:
a. Logistics Demonstration was not required during bid sample testing. The successful contractor is providing complete logistics inputs under contract CDRL requirements

19. Utilize Test Integration Working Group (TIWG) as Electromagnetic Environmental Effects (E3) Requirements Board

Respondent 9:
a. ?

Respondent 10:
a. Not relevant to my programs

Respondent 11:
a. If I can do it saving time and money I will, but I currently have little understanding of the E3 Requirements Board

Respondent 14:
a. The E3 Board doesn't make any sense, particularly for our programs

Respondent 16:
a. I think this is now a requirement for us

Respondent 22:
a. Need E3 requirements spelled out clearly in DoD 5000 or other regulations, TIWG must become familiar with E3 if this is to work, ARDEC is unmatched in their knowledge

Respondent 48:
a. We use TIWGs to manage all aspects of test program

Respondent 49:
a. Never addressed in our programs

Respondent 60:
a. No, members of E3 Board are subset of TIWG

Respondent 64:
a. ?

Respondent 69:
a. TIWG and TEMP approved the EMI testing conducted. EMP testing may be conducted for information only on First Article Test sample

Respondent 70:
a. TIWGs define test measures that allow us to assess performance of a system versus user requirement. In this we ensure systems are safe, effective, environmentally compatible, do not impose health hazards, survivable, etc. No reason to have E3 separate from a group of users, independent evaluators, logisticians, etc. whom bring already independent views and analysis

20. Conduct abbreviated Logistics Support Analysis and Reporting (LSA/LSAR)

Respondent 9:
a. ? I don't know enough about this

Respondent 11:

a. Yes, if the system is not too complex for the user to operate and maintain

Respondent 14:

a. Can conduct abbreviated reports only if TIWG, TRR bodies agree, particularly OEC, user and maintenance schools. If don't have their approval, won't get training certification for OT and the test won't happen

Respondent 16:

a. If a LSA is required it is tailored to the program

Respondent 48:

a. We do aviation ground support equipment, not major systems. LSA is tailored accordingly

Respondent 49:

a. Logistics support is very limited for off-the-shelf items, contractors provide support also
b. Cost can be reduced appropriately
c. Schedule can be shortened appropriately

Respondent 60:

a. No, LSA\LSAR not required for ammo

Respondent 64:

a. ILS manager to make decision

Respondent 69:

a. No, no LSAR inputs were obtained as part of bid sample testing, but successful contractor is doing full LSA as part of contract CDRL requirements

Respondent 70:

a. Yes, this area needs emphasis. As the LSA/LSAR analysis and reporting was based on major systems, I have found that mis-proportionate amounts of emphasis is placed on small items required little logistic support. Need common sense approaches - why have five logistics persons supporting a four member project office team?

21. Don't prepare separate Configuration Management Plan

Respondent 9:

a. Not necessary for ACAT IV, contractors are capable of doing this without being told to

Respondent 14:

a. Not sure what it is

Respondent 16:

a. Never prepared any separate CM Plan for my program

Respondent 22:

a. A lot of work to prepare and then not follow

Respondent 48:

a. Complexity and parts count of system

Respondent 49:

a. Configuration Management is usually controlled on a business as usual basis, plans are not usually generated
b. If a plan was generated there would be a cost savings
c. If a plan was generated the schedule would be shortened

Respondent 60:

a. No, Configuration Management Plan must be specific to parties involved

Respondent 64:

a. ?

Respondent 69:

a. No, Configuration Management Plan was not required for bid sample testing. Configuration Management Plan was required from successful contractor as a CDRL requirement

22. Don't generate Independent Life Cycle Cost Estimate

Respondent 3:

a. No, this document doesn't take long to prepare and is very useful

Respondent 9:

a. ?

Respondent 14:

a. In the R&D cycle, cost of the system is a guesstimate and seems useless to me. All the numbers that come out of it are just even further guesses

Respondent 16:

a. Always prepare this LCCE because it is an annex to the IPS and required for all milestones. Also, since we do not normally do COEA this is the major document to analyze the cost of the system

Respondent 22:

a. No, program should have schedule and program costs, how about using that

Respondent 48:

a. Relative cost of product, degree of user support

Respondent 49:

a. No, LCCE are needed for budget purposes and COEAs

Respondent 60:

a. No, summarized program

Respondent 64:

a. ?

Respondent 69:

a. Concept for fielding this NDI item was to use interim contractor support while acquiring provisioning information and technical data as CDRL items under the production contract. After interim contractor support period an economic analysis will determine if transition to full organic support is in the Army's best interest

Respondent 70:

a. No, I'm not confident that ILLCEs are always effective or accurate (due to strict format requirements), however realize their need in addressing cradle-to-grave issues. I think this area should be more flexible in preparation to ensure effective. Maybe more of an assessment and less concrete dollar figures, i.e., what are cost drivers over life cycle - discuss not estimate

23. Obtain Milestone Decision Authority approval to solicit a contract prior to Milestone Decision Review

Respondent 3:

a. This would definitely accelerate program when one is waiting for an IPR meeting before awarding next phase of contract

Respondent 9:

a. Gets the item to the field a lot quicker

Respondent 11:

a. Yes, if favorable milestone decision is fairly positive
b. Funding saved acting concurrently
c. Time saved acting concurrently

Respondent 14:

a. No, risky, a milestone will be done upon completion of testing, doesn't give you the ability to incorporate changes in contract unless by modification. Many contingencies and reduction can come out of an IPR, in certain cases maybe a good idea, to meet a schedule

Respondent 16:

a. Have never done this but can see the potential savings for time if the program is constrained by time

Respondent 17:

a. Contract award would be subject to. Would save time, especially on items with long lead times

Respondent 21:

a. No, too risky

Respondent 22:

a. Soliciting okay but award should wait until decision review

Respondent 48:

a. End of fiscal year award with late fiscal year MDR

Respondent 49:

a. No, changes at the milestone decision review could have contract implications

Respondent 60:

a. No, MDA approval not required to solicit for contract

Respondent 64:

a. ?

Respondent 69:

a. No, Milestone Decision Authority had test reports and independent assessments from all contractors bid samples tested before recommending production contract award and Type Classification Standard

24. Utilize a single contract for Dem/Val and EMD

Respondent 3:

a. This is a must in order to have any type of acceleration

Respondent 7:

a. Lower risks - corporate history/knowledge of contractor helps reduce risks (and schedule) in

second iteration

Respondent 9:
a. We do this now, basically, it works for us
b. Who has time (18+ months) to wait for procurement to award another contract
c. Money sits unused while procurement and legal diddle with the contract

Respondent 11:
a. Yes, but I would have to have a huge level of confidence in the system and that the Milestone II decision would be favorable. If I was going to hold a Milestone I/III, no problem
b. Funding saved to generate the new contract
c. Time saved to generate the new contract

Respondent 14:
a. Saves time of preparing, soliciting, and awarding contract. If new contractor, there will be a learning curve, starting a new contract will probably cost more than continuing with the previous one

Respondent 16:
a. Normally done because of our NDI approach and the combining of Milestones I/III

Respondent 17:
a. Saves time by not re-soliciting, better to have same contractor - no learning curve in EMD phase

Respondent 21:
a. Eliminates preparation of follow-up contract, saves time/money, better learning curve effect

Respondent 48:
a. Technical risk well understood and controllable, availability of funds

Respondent 49:
a.This approach would allow you to develop the final configuration during Dem/Val and smoothly transition to EMD
b. Cost for one contract award can be eliminated
c. Schedule would be shortened because of one less contract award

Respondent 60:
a. Phases combined

Respondent 64:
a. Save cost, save time

Respondent 67:
a. We are utilizing this

Respondent 69:
a. No, contractors provided their systems for bid sample testing and supported them through the test at no cost to the Government. The production contract award was sufficient incentive for their participation

Respondent 70:
a. Regarding ACAT IV programs, the time to complete Dem/Val may be the time to award a contract. Purpose of separating is to bring a complex effort into manageable pieces thereby reducing risk. In ACAT IV we usually have much less complexity and are able to manage the Dem/Val and EMD with less risk and greater ease

25. Utilize a single contract for EMD and First Production

Respondent 3:
a. It would be great to have a single contract to include Dem/Val, EMD, and Production
b. It would reduce time and add consistency
c. This would be a great incentive to the contractor as well

Respondent 7:
a. Have not done - but expect this to become the standard operating procedure in the future because of the new rules against using military specs and technical data packages

Respondent 9:
a. Great idea, lets me fix engineering problems before they hit high volume production

Respondent 11:
a. Yes, provided the first production was a contract option
b. Save the funding associated with a new solicitation
c. Save time to prepare the solicitation

Respondent 14:
a. Wastes time
b. Costs for start-up with each new contract

Respondent 16:
a. Have never done

Respondent 17:
a. Expertise gained by contractor during EMD phase would be valuable in production, could use a less-than-100% technical data package. Shorter lead time to production, tooling and ordering materials could be done sooner
Respondent 21:
a. Eliminates follow-up contractor, can hold contractor responsible for meeting design-to-cost goals, assess production readiness better
Respondent 48:
a. Technical risk low and well understood
b. Strong user support and need
c. Funds available
Respondent 49:
a.With a low risk program that will not see many changes during EMD, this would be appropriate
b. Cost for one contract award can be eliminated
c. Schedule would be shortened because of one less contract award
Respondent 60:
a. No, cost factors not fully known until after EMD build
Respondent 63:
a. No, development and production should be separate entities - production contract may be competed to reduce item cost
Respondent 64:
a. No, should foster competition in production contract
Respondent 69:
a. No, went from bid sample testing directly to a production contract award
Respondent 70:
a. No, I do not necessarily agree with concept of having first production by contractor developing system for small programs. I think TDP should be proven in production by another source to work out growing pains. Many problems in TDP may not come out if given to same contractor - just put off to later date. Idea ok if awarding two production contracts to two contractors

26. Conduct production First Article Tests to validate development deficiency corrections
Respondent 9:
a. We do this now, good opportunity for everyone to get many problems out in the open
Respondent 11:
a. I believe the validation of deficiency corrections should be done before the First Article Test, although if the relationship with the contractor is strong it may be worthwhile
b. Could save test costs
c. Could save up to 6 months
Respondent 14:
a. Objective of First Article Tests
Respondent 16:
a. This is done with the recommendations made by the evaluators. TECOM has the materiel release authority so they normally check the FAT to see if the corrections have been made before they will do the materiel release
Respondent 17:
a. Allows you to skip one of the development phases. This was done on SICPS Rigid Wall Shelter, good way to prove-out minor corrections to problems in DT
Respondent 21:
a. Cost savings, schedule savings
Respondent 22:
a. Want to check production ASAP
Respondent 48:
a. Reduce scope and timeline requirements of Government DT/OT testing
Respondent 49:
a.First Article Tests are usually conducted on a business as usual basis
Respondent 60:
a. First Article Test validates final product
Respondent 63:
a. No, development and production should be separate entities - production contract may be competed to reduce item cost
Respondent 64:

a. No, should foster competition in production contract

Respondent 69:

a. Conducting weapon firing tests (Government test) as part of Initial Production/First Article Tests to further demonstrate system reliability which was not adequately demonstrated in bid sample testing

Respondent 70:

a. No, This is commonly done and unfortunately, with less than desirable results. Leads to band-aid fixes that may never be truly fixed and a dissatisfied customer

27. Validate technical manuals/support system during first production instead of during EMD

Respondent 3:

a. Accelerates Type Classification

Respondent 9:

a. Good because engineering changes cause manual changes which cost money

b. You don't waste time on the manuals during EMD

Respondent 11:

a. No, I believe it would be risky to evaluate the manuals after EMD especially in todays environment where contractors manuals will be used as the military manuals

Respondent 13:

a. No, this would probably take too much time during production

Respondent 14:

a. Has to be done prior to IOT&E

Respondent 16:

a. ATCOM is responsible for our Technical Manuals and they are done in the production contract. Most of our designs are built for the first time in the production contract (new contractor, performance spec, etc.)

Respondent 17:

a. Usually, there is not enough RDTE funding to buy manuals during EMD. If you make design changes during First Production, the manuals will have to change anyway

Respondent 21:

a. If EMD and first production are performed under same contract or by same contractor

Respondent 22:

a. Better test of how support system will work

Respondent 48:

a. Reduce EMD timeline by deferring some if not all logistics activities to production

b. Risk of deferment

Respondent 49:

a.This will ensure the technical manuals are applicable for the production units

Respondent 60:

a. Easy to do in EMD

Respondent 63:

a. The TDP is firmer/more mature during first production and avoids unnecessary change if conducted during EMD

Respondent 64:

a. Cost of first production items less than during EMD

Respondent 69:

a. Only preliminary operators manuals were required for bid sample testing. Operator through DS/GS manuals are being obtained as CDRL requirements under the production contract

Other:

Respondent 10: Use capstone Program Management Documentation such as TEMPS, ASRs, and ORDs

a. Allows development of several related efforts without waiting for separate staffing and creation of multiple documents

Respondent 10: Use system integration of existing DoD and commercial items vs. new development

a. More bang for the buck, quicker time to field, meets the intent of getting equipment into soldiers' hands

Respondent 22: One big checklist of design requirements

a. Too many separate regulations with too much room for interpretation, should be able to go down list and address each requirement

Respondent 69: Cost Savings

a. Production unit costs were considerably under the independent Government cost estimate. The incentive of a multi-year contract and the inherent competition from the bid sample testing resulted in savings of approximately 40% of the IGCE

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11. U.S. Army Edgewood Research, Development and Engineering Center 1
ATTN: SCBRD-ASA (Dave LaBar)
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12. U.S. Army Armaments Research, Development and Engineering Center 1
ATTN: AMSTA-AR-RME-A (Bill Blackwell)
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13. U.S. Army Tank, Automotive and Armaments RDEC 1
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ATTN: AMSTA-RB (Jack Petersen)
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14. U.S. Army Aviation Applied Technology Directorate 1
ATTN: AMSAT-R-TL (Gene Birocco)
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15. U.S. Army Communications Electronics Command 1
ATTN: AMSEL-PE-PD (Nancy Roberts)
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16. U.S. Army Missile Command 1
ATTN: AMSMI-WS (Dr. Gene Paro)
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